

The Economist

NOVEMBER 28TH-DECEMBER 4TH 2015

Russia, Turkey and the fight against IS
The history of American xenophobia
Tech unicorns, a species in trouble
Do sugar taxes work?
A centenary of considerable gravity



A silhouette of a human head profile facing right, containing the Earth. The Earth is shown from space, with its blue oceans and green continents visible against a dark background. The sun is rising over the horizon, casting a bright orange glow across the top of the planet.

**Clear
thinking
on climate
change**

A 14-PAGE SPECIAL REPORT



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On the cover

Global warming cannot be dealt with using today's tools and mindsets. So create some new ones: leader, page 11. Not much has come of efforts to prevent climate change so far. Mankind will have to get better at tackling it—but must also learn to live with it, says Joel Budd. See our special report after page 42

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intelligence, which presses forward, and
an unworthy, timid ignorance obstructing
our progress."

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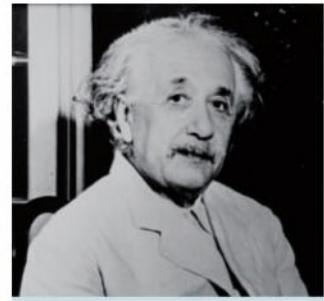
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Politics



Turkey shot down a **Russian** fighter-jet on its border with Syria, claiming the aircraft had violated its airspace. Russia is carrying out air strikes in Syria. Vladimir Putin, the Russian president, called Turkey's action a "stab in the back" and accused it of supporting Islamic State. Barack Obama said that Turkey had a right to defend its borders, but that America would also be willing to work more closely with Russia in the fight against is.

François Hollande, the president of **France**, went on a whirlwind tour to whip up support for a "grand coalition" against is following the recent attacks in Paris, which killed 130 people. He visited several leaders, including Mr Obama. David Cameron, the British prime minister, laid his case before Parliament for air strikes in Syria (British jets only operate in Iraq). Germany may share further aerial intelligence with France. But none has gone as far as Mr Hollande in declaring "war" on is.

The government in **Belgium** locked down Brussels, the capital, for four days over fears of an imminent terrorist attack. Schools, public transport and businesses were closed, concerts and sporting events cancelled. Police raided 22 locations in search of suspects linked to the Paris atrocity.

And on and on

Gunmen attacked a luxury hotel in Bamako, the capital of **Mali**, killing at least 20 people. The assailants also died. It was not clear who the terrorists were, though police guessed

they belonged to a jihadist group. A ten-day state of emergency was declared in the country, where around 1,000 French troops are deployed to fight against Islamic militants.

A suicide-bomber killed at least 12 troops on a presidential-guard bus in **Tunisia**. The attack was claimed by Islamic State. Is was also in action in **Egypt's** North Sinai, where seven people were killed in a hotel bombing.

One Israeli soldier died and at least five others were injured in the West Bank as a spate of attacks by Palestinians, using knives and car-rammings, continued. John Kerry, the American secretary of state, visited both **Israel** and the West Bank, and admitted that he hopes only for a decrease in tension, not a resumption of peace talks that stalled in 2014.

Hoping for a new start



Mauricio Macri, the centre-right mayor of Buenos Aires, won **Argentina's** presidential election, defeating Daniel Scioli, the governor of the province of Buenos Aires, who campaigned as the heir to the current president, Cristina Fernández de Kirchner. Mr Macri promises to reverse many of the populist policies of Ms Fernández, which have resulted in weak growth. He is expected to lift exchange controls and reach an agreement with foreign creditors, who forced the country into default in 2014.

Brazilian federal police investigating corruption at Petrobras, a state-controlled oil giant, arrested André Esteves, an investment banker, and Delcídio do Amaral, a leading

senator from the governing Workers' Party. Prosecutors allege that the two men tried to help a former Petrobras director who has been convicted of corruption leave the country.

Haiti's electoral authority announced the results of the first round of presidential elections, which took place in October. Jovenel Moïse, who is backed by the current president came first with 33% of the vote. He will face Jude Célestin, an ally of a former president, in a run-off.

Which way now?

Hong Kong held its first election since pro-democracy demonstrators staged weeks of street sit-ins in the territory a year ago. The voting, for district councils which advise the government on the provision of public services, showed that the territory remains deeply divided between advocates of much greater democracy and those who back the government's cautious approach to political reform.

The head of **China's** navy, Admiral Wu Shengli, said his forces had shown "enormous restraint" in response to "provocative actions" by America in the South China Sea. During a meeting in Beijing with Admiral Scott Swift of the US Navy's Pacific fleet, he said China had "the ability" to defend its sovereignty in the area, where it has been building islands and airstrips on contested reefs. America has angered China by sailing its navy close to them.

An American military inquiry found that an attack by an American gunship on a clinic run by Médecins Sans Frontières in Kunduz in northern **Afghanistan** in October was caused by "human error". The gunship killed at least 30 civilians, including medical staff, during a battle by Afghan and American forces to retake Kunduz from the Taliban.

A landslide at an open mine in Kachin state in northern **Myanmar** killed at least 100 mainly itinerant people scav-

enging through rubble for jade. The gemstone is at the heart of a vast trade in the state, helping fuel conflict there.

In **Singapore** the government lifted its ban on 240 publications, including "Fanny Hill", published in 1748, and "The Long March", a work of Chinese communist propaganda. Publications by the Jehovah's Witnesses church remain out of bounds.

Shades of blue



John Bel Edwards, a Democrat, won the governor's race in **Louisiana**, soundly beating David Vitter, a Republican Senator. It is the first time a Democrat has been elected to a statewide office in Louisiana since 2008. Bobby Jindal, the unpopular Republican incumbent, is stepping down.

Donald Trump reversed an earlier pledge not to run as an independent candidate for president should he lose the Republican nomination, and said he would consider doing so if the party does not treat him "fairly". The maverick candidate courted more controversy by suggesting that he would not rule out creating a database on Muslims.

A video was released taken from a patrol car showing the moment a white policeman in **Chicago** shot and killed a 17-year-old black man in an incident last year. The officer has been charged with murder. In **Minneapolis** five people attending a Black Lives Matter protest were shot and wounded. Three white suspects are in custody. A poll by CNN found 49% of Americans think racism is a "big problem", up from 28% four years ago. ►



TO BREAK THE RULES,
YOU MUST FIRST MASTER
THEM.

THE VALLÉE DE JOUX. FOR MILLENNIA A HARSH, UNYIELDING ENVIRONMENT; AND SINCE 1875 THE HOME OF AUDEMARS PIGUET, IN THE VILLAGE OF LE BRASSUS. THE EARLY WATCHMAKERS WERE SHAPED HERE, IN AWE OF THE FORCE OF NATURE YET DRIVEN TO MASTER ITS MYSTERIES THROUGH THE COMPLEX MECHANICS OF THEIR CRAFT. STILL TODAY THIS PIONEERING SPIRIT INSPIRES US TO CONSTANTLY CHALLENGE THE CONVENTIONS OF FINE WATCHMAKING.

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Business

Pfizer, the drug company behind Viagra, and **Allergan**, which makes Botox, agreed to combine in a \$160 billion deal, the biggest to date in the pharmaceuticals industry. Both companies conduct most of their business in America, though the complex merger will enable Pfizer to move its tax base to Ireland—where Allergan has its corporate headquarters—thus significantly reducing its American tax bill. Such acquisitions have whipped up a political storm in America. But Ian Read, Pfizer's chief executive, said the merger would make it more competitive globally.

Roiled-Royce

Rolls-Royce unveiled a restructuring plan to shore up investor confidence following five profit warnings. The British engineering company will shed more jobs and streamline management in response to falling demand for jet-engine maintenance and the turbines it supplies to the offshore energy industry. Warren East, the company's boss, didn't rule out a sixth profit warning, cautioning that the short-term outlook "is not as solid as I would like it to be".

National bank deposit-insurance arrangements among the euro zone's 19 countries should be replaced with a joint system to cover the currency bloc, according to the European Commission, which proposed a scheme that would protect savings of up to €100,000 (\$106,000) if a bank collapses. It says the scheme is needed to underpin a banking union, but Germany opposes any notion of pooling more financial risk with other countries.

The Dutch government floated 20% of the stake it holds in **ABN AMRO**, seven years after the bank was bailed out during the financial crisis. ABN AMRO was priced at €17.75 (\$18.80) a share upon its stockmarket debut, valuing it at €16.7 billion. It is the biggest banking IPO in Europe since 2007.

Italy's central bank helped to create a largely private fund that allows the government to rescue four ailing banks and hive off their poorly performing assets into a "bad bank". It seems to have acted now to spare senior bondholders any losses. From January, new European rules will require senior bondholders to share the cost of bank rescues, along with shareholders and more junior creditors.

A long-running battle over the world's largest undeveloped iron-ore deposit, in Guinea, took a twist in New York. A federal court threw out a **racketeering lawsuit** brought by Rio Tinto, an Anglo-Australian mining giant, against Vale, a Brazilian rival, and **BSGR**, which is linked to Beny Steinmetz, an Israeli billionaire, because of arguments over the legal niceties. Rio had alleged that the two companies had connived, with help from corrupt officials, to steal its rights to dig at Simandou. **BSGR** remains caught up in related bribery investigations in America and Switzerland. It has denied any wrongdoing.

America's economic-growth rate was revised upwards to 2.1% in the third quarter at an annual rate, from 1.5% in an

earlier estimate. The revision was mostly because businesses held higher levels of inventories than had been thought. The growth in consumer spending was revised down a bit but was still robust at 3%.

Back down to earth

Li Ka-shing, Hong Kong's richest man, who is nicknamed "Superman" because of his business prowess, was handed a rare setback. Mr Li is restructuring his business empire in order to pivot his investments away from China and towards Europe and Australia. But in a show of defiance, independent shareholders in a subsidiary of his Cheung Kong Infrastructure group voted down a proposal to merge with the parent company, following advice that the offer was too mean.

Carl Icahn, an activist investor, raised the pressure on **American International Group** to consider his proposal that the insurer split in three, by warning that he intends to take his plan directly to shareholders. AIG reiterated its position that Mr Icahn's idea makes no financial sense.

In a closely watched stock-market flotation that may help understand the true valuation

of Silicon Valley's "unicorn" startups, **Square's** share price rose by 45% to close at \$13.07 on its first day of trading, but only after pricing its IPO at \$9 a share, below the range of \$11-13 that it had hoped for. In trading over subsequent days Square's share price fell back.

Used rocket: one careful owner



Blue Origin, a space startup owned by Jeff Bezos, the founder of Amazon, successfully launched the world's **first reusable rocket**, which launched a test spacecraft that could eventually bring tourists to the edge of space. The capsule returned safely to ground, as did its BE-3 rocket booster. Space rockets usually break up when re-entering the atmosphere. Having a reusable one will cut the cost of space flight.

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



Clear thinking needed

Global warming cannot be dealt with using today's tools and mindsets. So create some new ones



IN SOME ways, the climate talks that begin in Paris on November 30th will show world leaders at their best. Taking a break from pressing issues such as terrorist threats and stuttering economies, they will try to avert a crisis that will pose its gravest risks long after they have left office. It is the opposite of the myopic thinking that is often said to afflict politics. A pity, then, that politicians have set themselves an impossible task, and that they are mostly going about it in the wrong way.

That climate change is happening, that it is very largely man-made and that it is exceedingly dangerous, are all now hard to deny (though America's leading Republican presidential candidates routinely try). This year will all but certainly be the hottest since 1880, when NASA's records begin. If so, 2015 will break a record that was set only in 2014. Every single year so far this decade has been hotter than every single year before 1998 (see our special report).

The wind turbines and solar panels that are spreading across Europe, America and China are barely restraining carbon-dioxide emissions. Since the turn of the century, global energy has become more, not less, carbon intensive. Coal now supplies 41% of the world's electricity and 29% of the world's energy—a bigger share than at any time in at least four decades. The atmospheric concentration of carbon dioxide is 40% higher than it was at the beginning of the industrial revolution.

A terrible two

The presidents and prime ministers who gather in Paris will insist that global warming must be halted before the world becomes 2°C (3.6°F) hotter than it was in pre-industrial days. That is what they have said for years but, considering the momentum behind climate change, this target is as unrealistic as it is arbitrary. If annual greenhouse-gas emissions remain at the present level, enough pollution will enter the atmosphere in just 30 years eventually to warm the world by two degrees.

Greens say that the target is a rallying point—that it is useful because it inspires action, and action, once under way, will inspire yet more action in a virtuous circle. If only world leaders would stiffen their spines and promise even more green energy, they argue, disaster could be averted. But this drastically understates the challenge. The parts of the planet that have become rich have done so by tapping a vast store of fossil energy with feckless, if understandable, abandon. For the rest of the world to join them over the century ahead, and then for all concerned—as well as the planet's non-human inhabitants—to flourish in the centuries that follow, will take a lot more than just a big expansion of existing renewable technologies.

The world and its leaders need more ambition and more realism. The ambition requires increasing the options available. Generous subsidies perpetuate today's low-carbon technologies; the goal should be to usher in tomorrow's. Unfortunately, energy companies (unlike, say, drug firms or car companies) see investment in radical new technologies as a poor prospect,

and governments have been feeble in taking up the slack. A broad commitment quickly to raise and diversify R&D spending on energy technologies would be more welcome than more or less anything else Paris could offer.

This would be costly. But remember three things. One is that spending money to reduce grave risks is reasonable. The second is that some of today's climate policies cost a lot more than a greatly expanded research portfolio and yield rather less. The subsidies that have created thousands of wind and solar farms have achieved only a little and at great cost. Other green subsidies, such as some of those for biofuels, have done actual harm. There is plenty of money to be saved.

A third is that one of the best measures against climate change raises money. Well-designed carbon prices can boost green power, encourage energy-saving and suppress fossil-fired power much more efficiently than subsidies for renewables. A few brave places have plumped to set such prices through carbon taxes: the latest is Alberta, in Canada. Most countries that have tried to price carbon have instead issued tradable pollution permits—invariably too many of them, with the result that the price is too low to change behaviour. Ideally such countries would admit their mistake and start taxing. Failing that, they should keep their emissions-trading schemes but add a floor price, and raise it steadily.

The new research agenda needs to tackle the deficiencies of renewables. Though solar, in particular, has become a lot cheaper, new materials, manufacturing and assembly technologies could make it cheaper still. Better ways of storing energy are required—so that wind or solar power can be used, for example, in the cold, still winter evenings when European electricity demand tends to peak. So are better ways of getting it from A to B, either through larger grids or in the form of newly synthesised fuels. Could biotechnology produce photosynthetic bugs that pump out lots of usable fuels? No one knows. It would be worth a few billion to find out.

Nor should the ambitions for research be limited to renewables. There are other forms of fossil-fuel-free energy, such as nuclear. Innovation in nuclear energy is not easy: such power plants are dangerous and need vigilant, independent regulation; they are unpopular and currently vastly expensive. But a civilisation that looks decades or more ahead cannot exclude new forms of nuclear from the research agenda.

Living with it

Radical innovation is the key to reducing emissions over the medium and long term, but it will not stop climate change from getting worse in the meantime. This is where the realism comes in: many people will have to adapt to a hotter Earth, and some of them will need help.

Wealthier countries (including China) have promised \$100 billion a year to help poorer ones. The trouble is that it is not clear what counts towards this total or what the money is for. If the Paris climate conference dissolves in rancour, this will probably be the cause. The priority should be research into crops that can survive extreme weather; better sanitation and health care to make the poor more resilient to climate shocks; ➤

► and cheap energy, whether green or not. The poor need all these things more than they need gifts of green-power technologies that even the West finds too expensive.

The final strand of new thinking ought to be research into cooling the Earth artificially. Climate models suggest that global warming could be slowed by spraying particles into the stratosphere or by using salt crystals to make clouds whiter, and hence better at reflecting sunlight. No one knows whether such “geoengineering” projects can be designed in a way that does not replace existing climate risks with worse new ones.

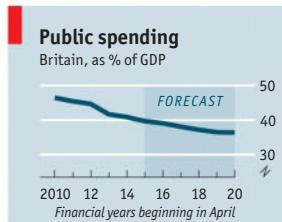
But that is a reason for research and debate, not for looking the other way. Geoengineering is not a substitute for cutting greenhouse-gas emissions (for one thing, it does not stop carbon dioxide from changing the chemistry of the oceans). But putting it off-limits, as many greens desire, is foolish.

In short: thinking caps should replace hair shirts, and pragmatism should replace green theology. The climate is changing because of extraordinary inventions like the steam turbine and the internal combustion engine. The best way to cope is to keep inventing. ■

Public spending in Britain

U-turns and new turns

Despite his retreats this week, George Osborne is remaking the British state



caused uproar for hitting the working poor, and shying away from a politically awkward trimming of the budget of the police soon after terrorist attacks in France. With the other, he was a determined reformer, continuing work on the most ambitious redesign of government since Margaret Thatcher. Inevitably, the u-turns captured the headlines. But it is the remaking of the state that matters more.

Speak their language

Mr Osborne is a lucky man. Because tax receipts between now and 2020 are likely to be higher than expected (and interest payments lower), he had £27 billion (\$41 billion) more to spend than he thought only four months ago. He raised the same amount again, and a little bit more, through tax rises, including a levy to fund apprenticeships. He has used this extra money to cut spending more slowly than he had threatened and, in some cases, to spare the knife altogether.

The chancellor was wise to scrap his plans to slash tax credits, a top-up to earned income pioneered by the previous Labour government. The planned cuts were highly regressive and they threatened to penalise extra earnings so heavily that they would have blunted the incentive to work. Best to swallow his pride and ditch a wrong-headed reform (though other changes to welfare will gradually replace tax credits with a benefit that is also less generous). His u-turn on the police also scored a rousing cheer in the House of Commons on the day—Tories instinctively back the men and women in blue. Here, however, Mr Osborne was not so clever. By giving in to one of Britain’s fiercest public-sector interests, he has suggested to all the others that they might see him off if they put up a decent fight. For the sake of a headline, he has made his job harder.

All in all, the pushmi half of Mr Osborne will spend £18.5 billion of his extra money. But don’t forget the pullyu. On entering office in 2010, the chancellor faced a deficit equivalent to 11.1% of GDP. Despite this week’s u-turns, he still plans to end this parliamentary term, in 2020, with the government in sur-

plus. Spending is to fall from 45% of GDP in 2010 to 36% in 2020. At the same time the chancellor wants to devolve fiscal and spending power away from Westminster.

Change on such a scale will lead to a fundamentally different sort of state. The past five years have shown that government departments can be cut without wrecking the things they provide. Despite dire warnings from public-sector unions, voters’ satisfaction with services has held up. Mr Osborne deserves credit for this, but he is taking a gamble with the changes still to come. By 2020 departments will be too cash-strapped to run things; public administration will be far more about awarding and overseeing contracts. That is a sensible shift, but it is not clear that bureaucrats are up to the job.

Worse, Mr Osborne has also made three mistakes. The first is that he remains wedded to the arbitrary—and political—goal of an overall surplus (including investment) by the end of this parliament. As a result, Britain has, and will continue to have, an unnecessary shortfall in capital spending on infrastructure. That is a source of inefficiency and, hence, low productivity.

The second is that the cuts have fallen unevenly. Health care, schools, defence and foreign aid have been protected, while other departments absorb the pain. The squeeze on many departments is intense. Some have responded by raising money in worse ways than taxation: the cash-strapped Ministry of Justice is making convicts pay to use courts, while the Home Office is levying absurdly high fees for visas. Redesigning the state in such a lopsided way defies logic.

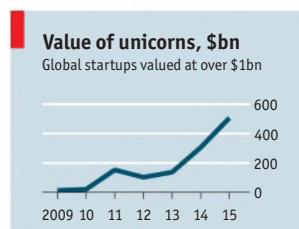
The third, related point is that Mr Osborne’s allocation of resources has been dictated by politics. The elderly, who vote and therefore have a special place in politicians’ hearts, received another above-inflation rise in their pensions this week, even as it was confirmed that poor students’ grants would become loans. Pensions are protected by a “triple lock”, which guarantees that they will rise by the growth in earnings, inflation or 2.5%, whichever is highest. Homeowners got a bigger giveaway in the form of interest-free mortgages on newly built London homes for first-time buyers, a recipe for even higher prices and rents (see page 52).

If Mr Osborne’s reforms are to produce the smaller, leaner, state he seeks, these flaws need to be addressed. The visionary will have to triumph over the political operator. That would both go against his style as chancellor and demand great political courage. It seems unlikely, but unless Mr Osborne can steel himself, his revolution will be only half done. ■

Tech unicorns

Gored

A correction in startup valuations would be good news for the technology sector



THE unicorn of myth can heal the sick and make poisoned water drinkable. The unicorn of the business world—the label given to privately held tech startups with a valuation of more than \$1 billion—has the power to bewitch investors.

The past few years have seen money slosh towards anyone in a hoodie. As well as venture capitalists, who typically finance entrepreneurs, more conservative fund managers have also been investing in these new tech firms. Today there are 144 unicorns valued at \$505 billion between them, about five times as many as three years ago. Most are unprofitable.

There are signs, however, that the spell is wearing off. Mutual funds have written down the value of their investments in several startups. Square, a payments firm, went public this month at a valuation (initially, at least) about a third lower than the headline figure from its previous fundraising. Funding rounds in Silicon Valley are happening less often and are taking longer (see page 57). Corrections are bound to be alarming, but this is one the technology sector should welcome.

True, at a time when America's economy is fragile, there is a risk of a dent to confidence. Yet this is hardly the dotcom bust all over again. That was a frenzy in public markets; the unicorns are largely the preserve of richer investors who are better placed to cope with losses. Mutual funds do manage small-investors' money, but are allocating only a slim slice of their portfolios to the unicorns. And if there is any borrowed money behind these firms, it is limited.

Indeed, a correction would deal with three big distortions brought on by surging valuations. The first is a blurring between the strong firms and the weak ones. When money is

pouring in, firms with the best managers and ideas find it harder to stand out from their wobblier but well-funded rivals. A willingness to burn through cash disguises flaws in business models. The food-delivery industry, for example, is one in which firms, from DoorDash to Postmates to Caviar to Munchery, have been happy to incur big losses to acquire customers. Costs spiral for everyone; M&A activity is stifled by inflated asking-prices. When funding is harder to come by, those firms that have either used the boom to store up lots of cash, or can lay out a plausible path to profitability, will do better.

The second distortion lies in the desperation to attain unicorn status. High valuations in general, and the unicorn label in particular, are so coveted that founders have, in effect, been happy to hand out privileges to investors in order to bump up valuations artificially. Such agreements include giving later-stage investors priority when firms go public, by handing them extra shares if the initial public offering results in a lower valuation than before. That means less is left for the real risk-takers—the entrepreneurs, early employees and initial funders. A correction may teach startups to focus less on headline numbers, more on fundamentals.

Public, not the enemy

The third distortion is the gulf between public and private markets. The ability of private markets to sustain new firms for longer than ever means entrepreneurs have more choices when it comes to how they run their firms. That is welcome. But public markets, rulebound though they are, still do some things very well: they impose greater scrutiny, and their deeper liquidity leads to more accurate pricing. If the prospect of listing on public markets comes closer because less private capital is available, the tech unicorn ought to become more disciplined as a result. That would be a rare beast. ■

Russia and Turkey

No room for manoeuvre

Don't let the downing of a Russian plane wreck the campaign against Islamic State



TURKEY'S strike on a Russian warplane on November 24th may have been avoidable, but it was hardly an accident. Turkey claims that, in the five minutes before two Sukhoi jets flew briefly across a finger of territory that pokes into Syria, it issued ten warnings. And despite Russia's denials and a suggestion that the missile may have struck one of the jets after it had crossed back into Syrian airspace, the run of the evidence is in Turkey's favour. Russia was provocative; Turkey was hot-headed. The task is to ensure that the winner is not Islamic State (is). That is now a danger, because the loss of the plane threat-

ens to poison relations between two countries intimately involved in the civil war inside Syria, on opposite sides. (Russia backs Bashar al-Assad's regime; Turkey, some of its Sunni foes.) Vladimir Putin, Russia's president, has called Turkey's act a "stab in the back by the terrorists' accomplices". He vows "serious consequences". Even now, Russia is bombing Syrian Turkomans, who have an affinity with Turks and live close to the border (see page 48). Yet friction between Turkey and Russia would frustrate what should be the overriding aim of countering is and bringing peace to Syria and Iraq.

A grave responsibility thus falls on the shoulders of the French president, François Hollande. Determined after the is attacks on Paris and armed with a UN resolution, Mr Hollande is shuttling from capital to capital to galvanise the effort against is. ■

► is. On November 25th he spoke to Recep Tayyip Erdogan, Turkey's president. A day later he was due to be in Moscow to meet Mr Putin (see page 47). Mr Hollande's task has just become harder, but it is also more crucial than ever.

Two things are needed to limit the fallout from Turkey's strike. The first is continuing public support from its NATO allies. Over the past year Russia has repeatedly encroached on NATO airspace, particularly around the Baltic states. After previous incursions, Turkey warned Russian jets and shot down a drone—which Russia disowned. NATO has a principled interest in discouraging further intrusion and in presenting a united front. Both require it to back Turkey.

Second, and privately, NATO members need to urge Turkey to show restraint and to change its behaviour. Turkey is hindering the campaign against is. It is more interested in striking Kurds inside Syria and removing Mr Assad than it is in crushing the jihadists. Moreover, it has failed to stop the flow of is's oil out of Syria and the flow of money and recruits back in.

Avoiding escalation is the easy part. Harder is the need to persuade both Turkey and Russia to focus more on is. Turkey needs to understand that, just as its NATO allies back it, so it has responsibilities towards them. Some Turks argue that fighting is will only help the Kurds. Even if that were true, Turkey also

stands to suffer from the depredations of is—witness two bombs in the past few months, in Ankara and Suruc, that between them claimed even more lives than the Paris attacks did. If Turkey really wants to get rid of Mr Assad, the only way is to work with Russia, not to fight it.

Something to agree about

Is Russia biddable? The signs are that Russia's Syria campaign is not going well. As well as a jet, it lost a helicopter, sent to rescue the downed pilots, to a missile fired by the anti-Assad Free Syrian Army. After years of fighting, the official Syrian army is in poor condition. With Russian air support, it is now holding steady, but it has failed to take back much territory. Mr Assad is so steeped in blood that he is a liability for Mr Putin. With him in power, there will never be peace. Mr Hollande should stress that Russia has its own reasons to fight is. It lost citizens in the bombing of a civilian airliner over Egypt, and home-grown jihadists are even now being radicalised inside Syria.

An alliance against is may be beyond Mr Hollande's reach. But he might yet shift priorities—to move is up the order and to get Turkey and Russia thinking about a settlement. The hope is that, as the morass in Syria deepens and the memory of the Sukhoi fades, Mr Hollande will find that time is on his side. ■

Argentina's presidential election

The ebbing of the pink tide

Mauricio Macri's remarkable victory will reverberate across South America



FOR the past 18 months or so Cristina Fernández de Kirchner has ruthlessly subordinated Argentina's economy and some of its institutions to a single aim: preserving her own popularity and thus securing the election of her chosen successor as the country's president. She ran down the Central Bank's reserves to next to nothing to maintain an overvalued official exchange rate. She ran up a fiscal deficit of 6% of GDP and spurned an inevitable deal with holdout creditors, raising its eventual cost.

Under her spell her hapless candidate, Daniel Scioli, an essentially moderate man, shrilly repeated that Mauricio Macri, his centre-right challenger in a run-off on November 22nd, was the puppet of evil global forces such as the IMF, foreign multinationals, "neoliberal adjustment" and so on. A similar strategy propelled Dilma Rousseff to a second term in Brazil's presidential election a year ago. It is to the credit of Argentines that they saw through it. They chose Mr Macri, albeit by a margin of less than three percentage points.

Mr Macri's victory, which only weeks ago seemed highly improbable, marks an important turning-point—for Argentina and the wider region (see page 31). At the head of a coalition of the centre-right, he has broken Peronism's seemingly iron grip on political power. And after 15 years of domination by various shades of the left, his victory may herald a shift back to the centre for South American politics.

At home, the greatest gains will be economic. Mr Macri and his team represent a rejection of Ms Fernández's autarkic brand of populism and offer the opportunity of saner eco-

nomic policies. He has promised to lift exchange controls and reverse the punitive taxation of farmers and the harassment of private investors. He will restore autonomy to the statistics agency, ending Ms Fernández's infantile attempts to cover up the inflation and poverty her policies generated. He has also promised to let the judiciary work unimpeded. This should include investigating the enrichment of senior officials in the Fernández government, including the president.

None of this will be easy, given Mr Macri's narrow margin of victory and the Peronists' control of the Senate. Many Argentines still associate Ms Fernández with subsidies, social programmes and an economic boom while commodity prices were high. They will resent Mr Macri for presenting them with the bill for her irresponsibility. Timing is of the essence: Mr Macri should speedily deal with the holdout creditors, to allow a return to international capital markets, and set a more realistic exchange rate. Then, as soon as prudently possible, exchange controls should be lifted. By using the powers of the presidency and negotiating with pragmatic Peronist governors, Mr Macri can get his way in Congress. In some respects Argentina is in less bad shape than in past political transitions. Farmers are poised to ramp up production (see Bello). Restore confidence, and flight capital should return.

The centre-right's opportunity

Mr Macri's victory will influence broader South American politics in two ways. First, he promises a change of foreign policy. He would "rebalance" relations away from Ms Fernández's alliances with China, Venezuela, Russia and Iran and towards normality with the United States and Europe. He will ask Mercosur to invoke its democracy clause to suspend Venezuela ►

▶ from membership of the regional bloc, unless the parliamentary election there on December 6th is conducted fairly and opposition leaders are released from prison. No other Latin American president has been so outspoken in criticising Venezuelan autocracy. His victory leaves Venezuela and its allies, including Brazil, looking more isolated.

The deeper point is that other countries may follow with their own shift to the centre-right. Although Argentines have yet to be exposed to the full cost of the left's economic mistakes, they have clearly tired of stagnation, corruption and divisive politics. In other words, the normal desire of voters in democracies for the alternation of power is now acting against

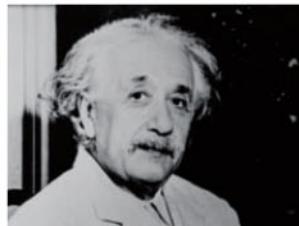
the incumbent governments of the left that have dominated South America this century. The end of the commodity boom, plus anger at economic mismanagement and graft, will almost certainly enable the opposition to win Venezuela's parliamentary election, too.

South America is not about to go back to the past. The left put inequality on the region's agenda and it is there to stay. But other issues are now equally pressing: a return to economic growth, clean government and tackling violent crime. The centre-right has a chance to return to power by capitalising on the left's failings in these matters. The hope for Latin America is that Mr Macri's victory is the shape of things to come. ■

The general theory of relativity

Thanks, Albert

Ten equations—and 100 years—have altered humanity's perspective on the cosmos



MOST scientific findings are sedimentary, slowly building upon the edifice of understanding. Rare is the idea that marks a fundamental change to a system of thought, forcing the rest of science to bend to its own vision. However, on November 25th 1915 Albert Einstein published a theory that did just that. The ten equations of his general theory of relativity set out a new concept of gravity—not as its own, independent force, but as the warping of the fabric of space and time in the presence of mass (see pages 70-73).

In the intervening century, Einstein himself has become a byword for cartoonish genius. His theory, however, is cherished less than it should be. That is partly because of its complexity; general relativity survived some trying experimental tests early on, but few scientists focused on it—in large part because its equations were so damnably hard to solve. And when the theory did take firm hold, it swiftly became so ubiquitous in describing astronomical goings-on that it began to be taken for granted. As a result, relativity's revelations are less widely appreciated than the ideas of Charles Darwin, or even Einstein's predecessor in gravitational thought, Isaac Newton.

Yet the world has much to thank Einstein for. Because of him, scientists think of space as, well, relative: what you measure depends on your vantage point, and on what mass is around you. An understanding of gravity's most subtle effects informs both the exalted and the everyday. Relativity permitted the *New Horizons* mission this year to steer a space probe through a 150km-wide "keyhole" near Pluto, nearly 5 billion kilometres away, after a nine-and-a-half-year journey. A more quotidian example of the extraordinary precision of relativity comes from satellite-navigation systems. Einstein's theory shows that satellites experience an ever-so-slightly different stretching of space-time in orbit than people do on the surface of the Earth—so the positional data streamed to smartphone users, and the time-stamps used for transactions in industries from banking to energy, must take in relativistic adjustments.

The theory has yielded odd surprises. It predicted, and then helped explain, the black holes that have captured public imagination. Efforts to join relativity with quantum mechan-

ics, in a field called string theory, are shedding light on science that is wholly unconnected to the heavens, including materials that conduct electricity without resistance and new kinds of information processing. This concordance across phenomena that seem so disparate is a tantalising hint that scientists may yet come up with a grand theory that incorporates all the physical forces.

Relativity's most overlooked triumph, though, has been to reframe the sorts of questions that stargazers ask. After the invention of telescopes in the early 17th century, astronomy concerned itself chiefly with discrete objects in the cosmos—peering at the planets and working out how they move, mapping how stars are distributed in the sky, and so on. General relativity got its start there, too, resolving a long-standing mystery of Mercury's orbit. But the implications of stretchy space-time quickly raised bigger questions: by the 1970s, relativity had become integral to describing the Big Bang. Not since Johannes Kepler's "*Mysterium Cosmographicum*", a 16th-century attempt to reveal the structure of the cosmos, were thinkers so inspired to consider the universe as a whole: its organising principles, its ultimate origins and what makes it tick.

Mind and matter

The restoration of this inquiry was not simply a matter of philosophy. General relativity came with its own experimental checks, some of which took decades to carry out. As it has passed these tests, relativity has set the stage for what is known as "precision cosmology". Exceptionally detailed theory lined up with ever-better observational data to furnish predictions about physical phenomena far away both in space and in time. Where once satellites and telescopes were deployed to scan for new sources of light, these instruments began to look to the dawn of the universe, and examine its frontiers with astonishing precision. From the vantage of relativity, researchers can speak with increasing authority of what happened in the earliest fractions of a second in the universe's history, and what might happen at its end.

That is an astonishing leap in perspective from just ten equations. Einstein's theory, and the intervening century of experimentation, provided a way to satisfy one of the most fundamental yearnings: to understand what is out there in the universe, how it all began and humanity's place in it. ■

A dimmer City of Light

Like everyone in France, I am truly saddened by what happened in Paris ("Paris under attack", November 21st). It felt like a Sunday taking the metro to work the week after the atrocity. The streets were almost empty. There was space everywhere. These latest events have definitely rattled the city. Yet one Libyan friend reminded me that terrorism happens on a daily basis in his country. People in Afghanistan, Iraq and Syria also have to deal repeatedly with terrorism. Paris will soon calm down and our lives will get back to normal. The same cannot be said for Syrians, Afghans, Libyans. Imagine living through a Bataclan-like attack on a regular occurrence with no end in sight. Worse, imagine the world not caring.

ROSELAIN PENNINO
Paris

You mentioned Paris's resolve "not to become Tel Aviv-sur-Seine". Given the grim reality of the terrorist threat, maybe Paris should be more like Tel Aviv, a modern, dynamic, thriving centre of commerce and culture that welcomes everyone and is resilient in the face of terror. The alternative, where daily life is disrupted, businesses close and people avoid their routine, is much grimmer and would destroy what Paris stands for. Paris and Tel Aviv are cities that for years to come will unfortunately need to cope with the perpetual threat of terrorism.

ARCHIL PITIMASHVILI
Madison, Wisconsin

With all this knee-jerk retribution against us we might do well to learn from "The Godfather's" Michael Corleone: "Never hate your enemies. It affects your judgment."

CLIVE ELSWORTH
London

Carrying guns on campus

If only it were the case that universities in Texas could thwart the new law that allows guns to be carried on campus simply by introducing gun-free

zones ("Revenge of the nerds", November 7th). Policies implemented by universities are reviewed by the state legislature, and if it does not agree it will legislate policy for us. I represent the faculty at my university on the working group looking at this "campus-carry" issue and we are bending over backwards to adhere to both the letter and the spirit of the law to avoid further interference from the legislature in our daily operations.

MARGARET WEIS
Texas Tech University Health Sciences Centre
Amarillo, Texas

Syria's refugees

Charlemagne (November 14th) is concerned about the 1m or so refugees that will have landed on Europe's shores in 2015. How about taking in 150m refugees? That would be under a third of the European Union's population, a similar proportion to the 1.5m refugees in Lebanon, which adds to the country's population of 4.5m. Lebanon is infinitely less able to accommodate Syrian refugees than Europe. It is a weak, very fragile country with high levels of public debt and unemployment, a delicate confessional balance between the various Muslim and Christian communities who have witnessed many decades of bloodshed, an already heavy burden from previous refugee crises, and continuing political strife. Moreover, demographically we do not need immigrants in the way that ageing Europe does.

European politicians want to keep the refugees over here until Syria's political mess is sorted out. If we want to be fair, all countries should set a standard "refugee percentage" of their population that other countries will respect. If Europe's refugee percentage was 2% say, it could take in 10m refugees over a certain period. Smaller countries like Lebanon and Jordan could reduce their current levels to about 100,000 refugees, until the political mess in Syria is sorted out.

MARWAN BARDAWIL
Beirut

Speakers cornered

In pointing out the absurdity of university students who demand protection from views with which they disagree, your leader ("The right to fright", November 14th) exaggerated somewhat in stating that "Fifty years ago student radicals agitated for academic freedom and the right to engage in political activities on campus". At Berkeley in 1971 I remember a speaker who had the temerity to defend the Reserve Officers' Training Corps on campus. He was shouted off the steps of Sproul Hall and prevented from talking. The Berkeley "Free Speech" movement did not stand for free speech, only for speech that agreed with the prevailing leftist orthodoxies of the time.

The only thing that appears to have changed is the justification for censorship. For years, many American faculty and student groups have demanded that "offensive" speech on college grounds be silenced, while reserving the right to designate which speech was offensive and which was not. Presented with the logical fallacy of such selective censorship, they now claim that their opponents' speech makes them feel "unsafe".

What will come next? A claim that their opponents' speech causes physical illness?

WILLIAM ABBOTT
Associate professor of history
Fairfield University
Fairfield, Connecticut

A drugs project that worked

The Economist's argument for state control of the heroin market is a pragmatic approach to a vexing problem ("How to smack it down", November 7th). In Britain in 1968 state-run clinics dispensed quality-controlled heroin to registered addicts.

According to the *New Yorker* in 1973 the changes attributed to this programme included a significant reduction in heroin-related crime, because addicts no longer had to thieve to pay the exorbitant black-market prices of illegal heroin.

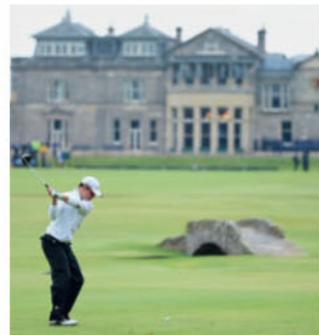
Also, the number of addicts was reduced, perhaps because they were offered treatment at the same clinics where they received their medications.

MARK HUTCHINSON
Ridge Manor, Florida

In need of real Republicans

You noted the lack of moderate voices and scarcity of conservative economic policy in the modern Republican Party ("The trouble with being right", November 7th). I am reminded of G.K. Chesterton, who, when writing about another body to which Republicans are often compared, said: "The Christian ideal has not been tried and found wanting. It has been found difficult; and left untried." A similar problem with the Republican perspective is that no one has tried it in decades.

TYLER STAHL
Ridgewood, New Jersey

It's not cricket

The ban on golf imposed by China's Communist Party members ("Bunkers, banquets and bribes", October 31st) may be regarded by hardliners as par for the course. However, it is not without precedent. A frustrated James II banned his Scottish subjects from playing golf in 1457 because it detracted from his archery. That ban in the home of golf was repeated 14 years later.

GAVIN MAITLAND
Boulder, Colorado ■

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Executive Focus

Chair, London



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Executive Focus



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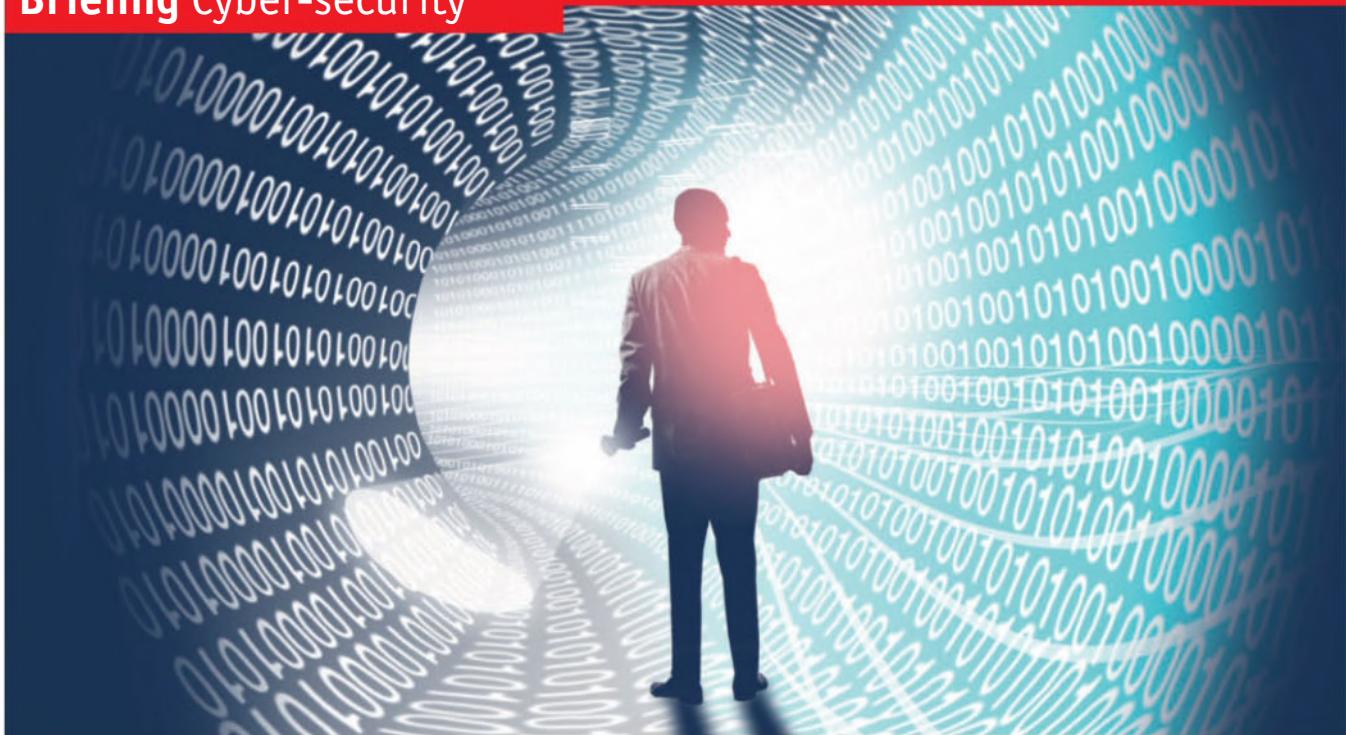
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The terrorist in the data

How to balance security with privacy after the Paris attacks

THE final text message from one of the Paris attackers was grim: *On est parti en commençant*, “We’re off, we’re starting”. It was found on a mobile phone dumped in a bin near the Bataclan theatre, where gunmen killed 89 people at a rock concert on November 13th. The phone’s digital trail helped lead investigators to a flat in Paris that was raided by armed police on November 18th; the presumed mastermind, Abdelhamid Abaaoud, and two others died there during a siege. The spoor of another phone linked an abandoned suicide-vest to Salah Abdeslam, a plotter who fled to Belgium and is now the most wanted man in Europe.

The vast stores of digital information generated by everyday lives—communications data, CCTV footage, credit-card records and much more—are yielding invaluable clues about the attack and are helping guide the hunt for the surviving plotters. Yet it is also painfully apparent that much information that could and should be known is not: France complains that no European country had warned it that Mr Abaaoud, who fled to Syria and was wanted by the Belgian police, had returned to France though he must have passed one or other European frontier (the tip-off eventually came from Morocco). At least two attackers slipped into Europe via Greece,

posing as refugees. Yet police forces do not have routine access to the database of asylum-seekers’ fingerprints.

All of which raises troubling questions: should the digital clues have been picked up sooner; do Western intelligence agencies and police forces share information properly; do they need to collect even more data and have greater powers to search it; and should encryption that scrambles data be regulated? In other words, the Paris attacks are forcing Europe once again to weigh the proper balance between security and privacy.

Picking up the pieces

Attitudes to data privacy in the West vary markedly between countries, not least because the debate has been polarised by the revelations of Edward Snowden, a fugitive contractor for America’s signals-intelligence outfit, the National Security Agency (NSA). He disclosed large-scale spying by America on its friends and foes alike. Some see Mr Snowden, who now lives in Moscow, as a heroic whistle-blower; Western spooks are furious about the damage he has caused.

Each government sets different rules for what spies may look at, and who should oversee them. These apply to what may be done by way of bulk collection (vacuum-

ing up vast quantities of metadata, such as the destination of calls, in order to find patterns) and targeted surveillance (eavesdropping on the content of communications of a specific person or group). America and Britain gather the largest haystacks of data to seek traces of terrorists and criminals. In part they do so because they can: the biggest internet firms are American, and some of the most important undersea fibre-optic cables run from Britain.

America has an intelligence court, where judges must give warrants for surveillance that includes Americans’ private data; the system is also overseen by well-staffed congressional committees (though American privacy campaigners find even this too weak). In Britain responsibility for approving eavesdropping rests with the home secretary. France allows its intelligence and security services even looser reins, especially after the *Charlie Hebdo* murders in January.

The latest slaughter in Paris, and the subsequent manhunts in Brussels, the home or base of several of the attackers, suggest that European rules will shift further towards security. European interior ministers agreed on November 20th to make a renewed push to adopt a plan to share Passenger Name Record (PNR) data for all travellers to, from and within the European Union (it is being held up by the European Parliament because of concerns about data privacy). They also vowed to exchange more information about fighters travelling to and from Syria; check biometric data of all EU citizens at the external borders of the Schengen free-travel zone; and link European and national police databases more effectively.

The appetite for this is, understandably, strongest in France. It is weakest in Germany, which has a particularly fastidious approach to protecting data about its citizens: information can be shared only with the person's explicit consent, or with specific (and rare) legal authorisation. That stems from the country's grim past of Nazi and communist totalitarianism. Moreover Germany has suffered just one serious jihadist terror attack in recent times—when an Albanian Muslim shot dead two American airmen at Frankfurt airport in 2011. Germans reckon smugly that their foreign policy has been less reckless and therefore made fewer enemies. Germany's Muslims, mainly of Turkish extraction, are more secular and less alienated than those of Arab origin in France's *banlieues*. Germany's safety also rests on good intelligence, both from its own agencies and from allies, notably America. This has thwarted several plots. On November 17th a Germany-Netherlands friendly football match in Hanover was cancelled for fear that it would be attacked with bombs.

In truth, Germany has yet to have an honest debate about its spooks' powers. After Mr Snowden revealed that the NSA had perhaps tapped Angela Merkel's mobile phone, the chancellor said sanctimoniously: "Spying among friends is just not on." A parliamentary inquiry then found that Germany's spies had been collaborating gratefully (subserviently, critics said) with America. They were also spying on other European governments, bodies such as the International Red Cross and Oxfam, and on individuals. So whereas France is giving its spies even more powers, Germany is drafting a law to rein them in. A new and beefed-up parliamentary committee, staffed with experts, will oversee Germany's foreign and domestic spies.

For many privacy campaigners, even the most carefully monitored spooks should not be allowed to collect vast amounts of information. Many Europeans see digital privacy as a fundamental human right; America considers it mainly in terms of consumer protection, which allows exceptions to be made when national security is at stake. The idea that PNR data should be shared freely among European states, let alone with America, is contentious. The European Court of Justice has struck down the EU's "Safe Harbour" agreement with America under which tech firms were allowed to move personal data across the Atlantic. It ruled that, because any data in America are subject to NSA snooping "on a generalised basis", Europeans' right to privacy was under threat. Britain is worried that the court may rule in a case next year that much of its electronic eavesdropping is simply illegal.

Beyond the collection of data, a related problem is encryption, which allows people to communicate so securely that even

Nobody is safe from cybercrime

Average annualised* cost of cyberattacks on American firms^t, by industry sector, 2014, \$m



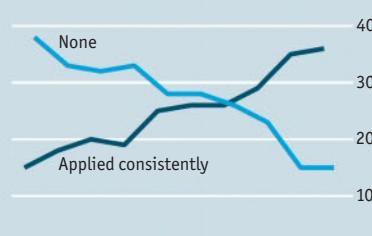
*Data collected over four consecutive weeks
Source: Ponemon Institute
^t39 organisations

spy services such as the NSA cannot crack messages by brute force. The director of America's FBI, James Comey, notes that the jihadists of Islamic State use encryption to communicate with new recruits, "going dark", as he puts it. John Brennan, director of the CIA, says new capabilities make it "exceptionally difficult both technically as well as legally" to intercept terrorists' communications. The Manhattan district attorney, Cyrus Vance, says "encryption blocks justice": he cites 111 criminal cases in which his office had been unable to tap encrypted phones. A few days before the Paris attacks Jan Jambon, the Belgian interior minister, expressed concern that terrorists were communicating through internet-linked gaming consoles, saying: "PlayStation 4 is even more difficult to keep track of than WhatsApp."

Law-enforcement officials worry about any kind of "no go" zones where their search warrants cannot reach. Just as child-abusers, gangsters and money-launderers can be hunted always and everywhere in the real world, the same should apply to cyberspace, they argue. Western spymasters, long used to having the upper hand

Still not scared enough

Companies' encryption strategy*, %



Sources: Thales; Ponemon Institute *4,000 business and IT managers from 10 countries

because of their colossal abilities to collect, sift and crunch the data flowing across the internet, note with dismay that there are now some areas where an individual with a cheap computer may have the advantage: it is easy to scramble messages, and can be fiendishly hard to unscramble them without the encryption keys.

Security hawks want to counter the spread of encryption with four powers. First (in rising order of controversy), technology firms should be obliged to store messages that their clients send across their networks and from their devices, meaning that the government code-crackers at least have the raw material they need to work on. Second, companies should be required to crack any code they sell, when presented with a warrant. Third, they should be banned from selling computer programs (or apps, in the case of smartphones) which encrypt messages in a way that the provider of the service cannot break. And fourth, companies that sell encryption programs should build in deliberate weaknesses so that police (or spooks) can break the codes themselves.

The trouble with such proposals is that encryption is already widespread. Some law-abiding citizens and malefactors will switch to providers in countries that are not subject to tighter rules on encryption, or devise their own systems. Protonmail, for example, is a provider of heavily encrypted e-mail based in Switzerland, where it is protected by that country's strong privacy laws. But even if foreign law-enforcement officials or intelligence agencies surmounted that obstacle, they would encounter another. Protonmail by design does not store its users' messages on its servers, or hold copies of their encryption keys. Even the most ferocious government intervention cannot force firms to hand over things they do not have, or betray secrets they do not know.

Robert Hannigan, the director of GCHQ, the British signals-intelligence service, says that internet companies' desire to be "neutral conduits of data and to sit outside or above politics" meant that they were, in effect, providing the "command-and-control networks of choice for terrorists and criminals". It would be better to face up to such uncomfortable truths now, he wrote in the *Financial Times*, than in the "aftermath of greater violence". Ten days later Islamic State killers struck Paris.

Forcing companies to weaken their encryption software arouses strong opposition among tech firms and privacy campaigners alike. America's Information Technology Industry Council, which represents giants such as Apple and Microsoft, said: "Weakening security with the aim of advancing security simply does not make sense." Compromising it would endanger the security of, among other things, the banking system and the electrical grid.

► On this the tech firms are on strong ground: weakening encryption in the name of the fight against terrorism will make it easier for cyber-criminals and other malefactors to steal money, identities and more. If anything, the world needs more encryption, not less of it.

Cybercrime is booming (see breakdown in chart 1 on previous page)—the global cost was up to \$575 billion in 2014, according to a guesstimate by McAfee, a computer-security firm. Far too many people, firms, organisations and government agencies lack the skill or will to encrypt data consistently on their networks and computers, even when they hold sensitive information about others (see chart 2).

Encryption is the essential enabler of an increasingly digital world. It allows people to establish their identity reliably, and keeps transactions out of criminals' reach. The simplest identifying protocol is a user-name and password, but these are easily guessed or stolen. Much better is to use so-called “two-factor authentication” which combines a permanent credential (such as a password) with one generated by an electronic device—for example a code produced on a mobile phone. These are not invulnerable, but criminals are lazy: just as burglars prefer a house with an open window to one with stout locks, cyber-criminals seek the easiest targets.

Stealing digital candy

Even big firms fail to understand cyber-security. Recent breaches at TalkTalk, a big British telecoms company, exposed a striking level of ignorance. Its chief executive, Dido Harding, was unable to say whether her company's database of users' personal and banking information was encrypted (it wasn't). In America, prosecutors recently laid bare the way in which criminals stole 100m people's personal details from companies such as JPMorgan Chase.

Governments have proven incompetent, too. A breach at America's Office of Personnel Management led to the loss of sensitive information, including security clearances, on about 20m current and former federal employees. Given such a lamentable record, it would be hard to trust governments or firms to collect encryption keys and keep them safe.

Some Western spymasters accept the need for stronger encryption. Mr Hannigan says the idea that GCHQ wants to weaken it is a myth; what it seeks is access to stored information when it is needed to ensure national security and investigate serious crime. Perhaps Mr Hannigan is just being realistic. Or perhaps he is conceding that the pattern of terrorists' communications—who is in touch with whom and when—can be just as important as the content of messages, which is often ambiguous anyway. Another possibility is that the intelligence agencies have learned how to

crack at least some of the previously impenetrable codes. Neither the NSA nor GCHQ talks about rumours to this effect that have long trickled around the internet.

In any case, even the best encryption has a weakness, in the form of the humans at either end of the message. Encryption is best thought of as a tunnel between two computers. However deep, secret and well-protected it may be, it must have an entrance and an exit. At the point at which the message becomes visible or audible to human beings, it is also potentially accessible to snoopers: they can take an image off a screen, or a copy of whatever is typed on a keyboard, or, indeed, bug the room with a pinhole camera and microphone. So long as the authorities know which people and devices to concentrate on, they have a

But these rules are rarely enforced and the data collected are not shared automatically with law-enforcement authorities. Many countries are tightening their rules. Belgium is considering banning the sale of SIM cards—the chips that enable phones to connect to the mobile network—to customers without ID. Bangladesh is rolling out plans for biometric identification of all mobile-phone users. Nigeria has fined a big mobile-phone firm \$5 billion for failing to register SIM cards properly—the authorities say that they are used by Boko Haram, a jihadist group.

Such moves are controversial. But in real life anonymity is constrained, too. In most countries it is not possible to drive a car without registration plates, a licence or insurance. Most require babies to be registered at birth, and issue numbers to track payments in and out of social-security systems. People do not expect to live in an anonymous house, draw an anonymous income or (nowadays) open an anonymous bank account. The history of technology is full of examples of belated regulation of new devices and capabilities. Cars and planes used not to have numbers; drones are now coming under scrutiny.

The strongest case for anonymity is the protection of privacy. It allows people to do things they would not do if their names were attached to those actions. Just as they have the right to slip into a busy street without being observed, goes the argument, so too should they have the right to go online anonymously.

Yet the idea that one can hide in the crowd—“security through obscurity”, as some call it—is mostly fiction. The combination of powerful algorithms, greater processing power, almost limitless computer memory and huge capabilities in data collection mean that people are far more visible than many realise—to private firms if not to governments. Most people give away vast amounts of private personal information in exchange for services such as “free” e-mail (far from being the customer, they are the product: their attention and profile is being sold to advertisers). Every website can record the details of the visitor's browser and computer settings that often make up a unique fingerprint.

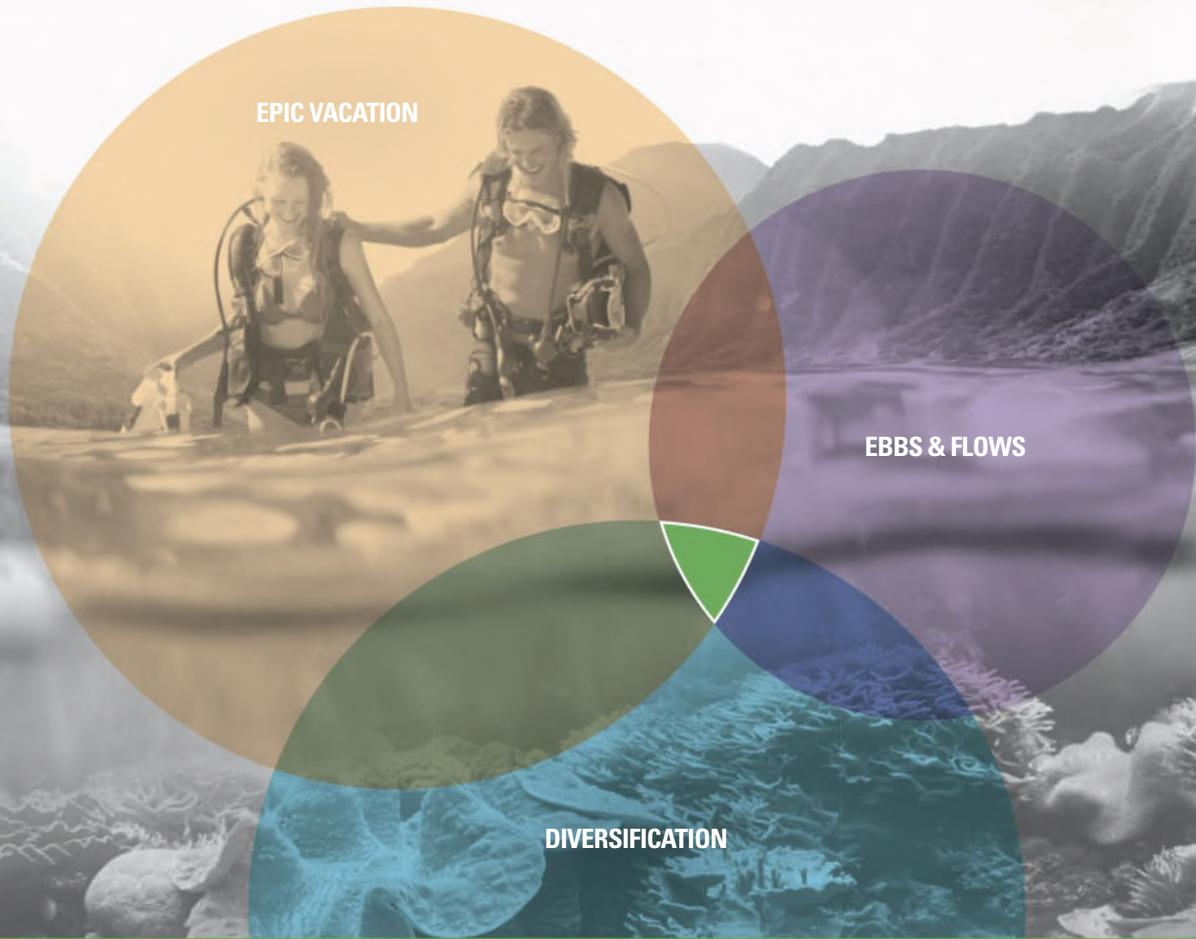
After the Paris attacks, democratic societies can reasonably ask whether the right to remain anonymous, be it online or travelling around Europe, should remain near-absolute. As long as there is proper democratic oversight of those handling the data, Europeans will have to give up some anonymity to preserve the liberty and security that matter. In an open internet, the security of personal data and identities should be preserved with strong and ubiquitous encryption. In an open Europe, personal safety is best safeguarded by police and intelligence services sharing information as seamlessly as do the terrorists. ■



good chance of intercepting their communications. A draft bill on surveillance oversight now before the British Parliament would give explicit legal authority to GCHQ to break into computers and mobile phones for the first time.

All this suggests that, rather than attacking encryption, Western governments would do better to deal with a related but distinct problem: anonymity. On the internet users can adopt any name they want when they open an e-mail or social-media account, write comments on a web page or set up a website. People can buy and use a smartphone while giving flimsy or false personal details, or none at all. These freedoms are convenient and cherished. They allow people living under authoritarian regimes to mask their activities from the authorities. They allow people to experiment and play in private. But they also allow criminals and terrorists to hide.

Many countries now require those who buy mobile devices to provide some form of identification (Britain is an exception).



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America and Syria

In Russia's defeat he trusts

WASHINGTON, DC

The attacks in Paris have not changed Barack Obama's course on Syria. Little could

AS AN expression of solidarity with America's oldest, currently bruised, ally, Barack Obama's words of welcome to his French counterpart on November 24th might sound a bit cloying. "We love France for your spirit and your culture, your *joie de vivre*," he told François Hollande. "Since the attacks, Americans have recalled their own visits to Paris, visiting the Eiffel Tower or walking along the Seine." "Oh là là!" Mr Hollande might have been forgiven for muttering. He had come to Washington to persuade Mr Obama to lead a more aggressive campaign against his country's scourge, Islamic State (is), not to be galled with onions.

The many, including in Washington, who hoped the massacre in Paris would induce Mr Obama to launch a bolder attack on the jihadists have been disappointed. Mr Hollande wants more American military support for the "merciless" campaign he has promised against is. Mr Obama seconded that ambition, reiterating his vow that the terrorists "must be destroyed". Yet he promised no new American means to that end, apart from more US-French intelligence-sharing and, in the event that the European Union makes its airlines share passenger information, as Mr Obama said they should, American experts to help out.

He probably worries that America is overcommitted in Syria already, having last month announced a step-up in opera-

tions against is, including the dispatch of "fewer than 50" military trainers to help its Syrian enemies, which he had previously resisted. The most modest deployment of ground troops imaginable, this was made necessary by the failure of America's pre-existing, out-of-country, training plan, which cost \$500m, put less than half a dozen fighters in the field, and appears to have been scrapped last month.

It was also partly a reaction to Russia's intervention in September on the side of Syria's president, Bashar al-Assad—or, at least, to the fury this unleashed among domestic critics of Mr Obama's cautious policy on Syria. Elected, as he saw it, to end wasteful foreign wars, his response to the four-year-old crisis has been governed by an overarching reluctance to commit America to another one. The result, say his critics—the ranks of whom, since Paris, Hillary Clinton, his former secretary of state, and Leon Panetta and Chuck Hagel, both former defence secretaries under him, have flirted with joining—has been a policy designed to answer the political exigency to act with minimal action.

When Mr Assad gassed his own people in 2013, Mr Obama let him off with a warning. Asked to consider establishing a no-fly zone to stop the Syrian leader's more conventional methods of slaughter, the president last year authorised the, since failed, training programme. When is surged, he

sent no ground troops to stop it, only air strikes; they have so far cost an estimated \$5 billion and accounted for a few of the group's leaders, without threatening to cost it territory. Offering Mr Hollande, after the savage assault on his country's capital, technical expertise on airport security, was in line with that record.

Mr Obama is unfazed by his critics: he mainly considers them either disingenuous or deluded. In the former camp, he puts members of the Republican-dominated Congress who accuse him of failing to take decisive action—though many of the same politicians had sought to deny him, in 2013, the authorisation he had requested to bomb Mr Assad after the gas attacks. In the latter crew he places those, including several of his former advisers, who advocate a more aggressive assault on is, perhaps in tandem, as Mr Hagel suggested this week, with a temporary slackening of American resolve to depose Mr Assad.

Mesopot-mania

The notion that American or any other foreign troops could provide a viable security alternative to is was for Mr Obama conclusively disproved by the mayhem they unleashed in Iraq. The choice between prioritising is over Mr Assad, he believes, is a false one, given the extent to which the Syrian leader's predations on Syrian Sunni Muslims have fuelled the jihadists. That leaves his gradualist strategy, minimalist as it might seem, of containing is with air power, while strengthening both the jihadists' and Mr Assad's local enemies, and meanwhile working on the Russians to abandon their proxy, as the least-worst option. "We have the right strategy and we're going to see it through," he declared shortly after the Paris attacks.

This has not much reassured Ameri- ►

cans, almost 70% of whom now worry about the prospect of a terrorist attack in America. Yet if Mr Obama can seem tattered to that nervousness, he has a point. Most of the criticism of his handling of Syria is retrospective; it is mainly focused on his failure to punish Mr Assad for the gas attacks. Few of his critics are proposing any striking alternative to his current course.

Among the contenders for the Republican presidential nomination, who have most to gain from slamming him, only Lindsey Graham, a trailing no-hoper, proposes sending many American troops against IS. He advocates sending 10,000 as part of a 100,000-strong allied army (it is not clear who would provide the remaining 90%). The alternative course suggested by Jeb Bush and Marco Rubio, the other Republican contenders who have spoken most about Syria, are more modest. Mr Bush would also send some more ground troops and use them to call in air strikes on IS and both would enforce a no-fly zone to hamper Mr Assad. So would Mrs Clinton, in a break with Mr Obama that will grow as and when she secures her party's nomination. Yet arguing over no-fly zones, an option that Mr Obama dislikes but has not ruled out, looks like a red herring. They would not take the fight to IS, which has no air force, and would raise the risk of confrontation with Russia.

As a rebuke to America's global leadership, the Russian intervention is a major cause of the unhappiness Mr Obama is facing over Syria. Americans reasonably consider it a response to their absence from the battlefield. Primarily aimed at Mr Assad's non-jihadist enemies, it also appears to have impeded America's year-long bombing of IS. Since the Russians began flying sorties over Syria in September, there has been a reduction in American ones, allegedly (and though the administration refutes this) to mitigate the risk of a US-Russian collision. And yet, in a negative sense, Mr Obama's administration seems to be investing more hope in President Vladimir Putin's intervention than its own.

If America's Syria-watchers agree on anything it is that the Russian campaign, which has enabled Mr Assad's forces to make only minor gains, will fail, and thereby encourage Russia to give up on its proxy. That would be a huge boost to the UN-backed peace talks John Kerry, the secretary of state, is brokering, with the aim of replacing Mr Assad with a transitional government early next year. His exit, or even a growing prospect of it, would in turn be expected to embolden moderate Sunni Muslims to turn against the jihadists who are currently their most successful co-religionist representatives.

It is wishful, but such is Mr Obama's plan, and it is hard, barring a major attack in America, to see what might make him expand on it. Certainly, Paris could not. ■

Trump in history

This land is our land

ATLANTA

The current spasm of nativism is far from unique. That may be some consolation

ACENTURY ago many Americans fretted about a minority in their midst, which reputedly owed its first loyalty to an obscurantist faith, and which, in league with foreign conspirators, was poised to destabilise the country. In particular they suspected—as some Republican presidential candidates imply today—that houses of worship had become dens of sedition and vice. So it was that several states passed “convent-inspection” laws, to help uncover stashes of arms supposedly hidden in nunneries by Catholic traitors (as well as maidens immured against their will). Donald Trump, eat your heart out.

Actually Mr Trump's plans for monitoring mosques are not the most egregious aspect of his anti-Muslim platform: the authorities of many mosques, having no wish to harbour extremists, already voluntarily liaise with the security services. Even uglier was the stampede, of governors and congressmen as well as presidential candidates, to insist that Barack Obama abjure his (rather paltry) plan to take in some 10,000 Syrian refugees next year. Jeb Bush and Ted Cruz advocated the selective admission of Christian Syrians; Ben Carson compared dangerous refugees to rabid dogs. The fact that European passport-holders pose a much greater threat than fleeing Syrians barely disturbed this mean-spirited chorus.

After the atrocities in Paris, Muslims have replaced the much-maligned Mexicans as the main object of nativist ire. Alas, the rhetorical potential of hypothetical Syrians was quickly exhausted; some candidates soon progressed from the Muslims they want to keep out to those already in America. Mr Trump pledges to deport the few Syrian refugees who have come (along with 11m undocumented migrants). He revived the discredited canard that thousands of Arabs in New Jersey celebrated the destruction of the World Trade Centre in 2001. Worst of all, perhaps, he entertained the idea of a register of American Muslims, a prospect at which even Mr Cruz balked. He later sought to finesse that, perhaps in characteristic confusion about his own policies, maybe in the confidence that his intended audience had already heard him. Of course, on Muslims, both he and Dr Carson have pre-Paris form: Dr Carson seemed to suggest that no Muslim should become president; Mr Trump failed to object when a questioner suggested America “get rid” of all of them.



He'll make the trains run on time

These men do not speak for all Americans; but—not surprisingly, in the wake of the September 11th attacks—polls suggest their remarks do have a constituency and their bilious contest a prize. Muslims are the least-popular religious group in America, according to the Pew Research Centre. They are especially unloved among Republicans, who also tend to be most disenchanted with Barack Obama's approach to counterterrorism. Sometimes, though, Mr Trump seems to be peddling something darker than anti-terror zeal. His strongman shtick, enthusiasm for waterboarding and nonchalance over the beating of a protester at a recent rally (“Maybe he should have been roughed up”) give off an incipient whiff of a kind of bouffant fascism.

To Americans alarmed by this intolerant turn, it may be some consolation to know that their country has taken and survived them before. For much of America's history, Catholics were among the main targets of bigotry, often depicted as clannish, superstitious and loyal to a foreign power. That antipathy dated to colonial times, when one popular children's game was called “Break the pope's neck”; Guy Fawkes Night was widely celebrated until the revolution. Anti-Catholic agitation was exacerbated in the mid-19th century by escapees from Ireland's potato famine and the arrival of Catholics from Germany. It manifested itself in the Know-Nothings, a

► secret society-cum-political movement, and in church-burnings and deadly riots. In California there was similar unease about the influx of Chinese.

Anti-papist feeling swelled again in the hardscrabble 1890s, this time directed in part at Italians and Slavs. Wayne Flynt, a historian at Auburn University, cites the lurid case of Sidney Catts, a Baptist minister from Alabama who became an insurance salesman in Florida and in 1917—on the back of his fearmongering—the state's governor. Catts claimed Catholics were storing arms in a Tampa cathedral; there were whispers of a papal invasion, followed by the construction of a new Vatican in Palm Beach. Convents were scrutinised; anti-Catholic fraternities abounded. One such was consecrated precisely 100 years ago, on November 23rd 1915, when a giant cross was burned on a mountain outside Atlanta and, after a hiatus since Reconstruction, the Ku Klux Klan was reborn.

The Klan's victims also included Jews, who, while never as reviled as American Catholics have been, were the subject of twin prejudices in the 1920s and 1930s. As Hasia Diner of New York University puts it, the upper stratum of society feared the Jews "were worming their way into elite institutions", while some ordinary folk thought them "bent on undermining small-town American simplicity". Among the latter camp's champions was Henry Ford, who reproduced the "Protocols of the Elders of Zion" in his *Dearborn Independent*, which was stocked in all his car showrooms. Jews were held to have caused the Wall Street crash and the first world war, and, as another war loomed, were allegedly bent on dragging America into it.

These are disparate incidents, but they suggest some patterns. One common circumstance is economic pain, whether that involves immigrants stealing jobs and resources or globalisation exporting them. Another is anxiety over national security, as in the interning of Japanese-Americans after the bombing of Pearl Harbour or the anti-communist witch-hunts of the cold war. A third is racial and religious unease. All these neuroses are combustibly combined in today's post-recession panic about Muslims and Islamic State.

Get thee to a nunnery

America is by no means the only Western democracy prone to spasms of nativism. Nor is it the only country liable to forget—and so repeat—its misjudgments of earlier newcomers: look at Britain's Jews and Ugandan Asians, both resented when they landed but now extolled as model minorities. Established immigrant communities can be uncharitable to later groups elsewhere, too. But there is a special disjunction between America's xenophobia and its lofty ideals, and sometimes (as in the past few weeks) a distinct ferocity in the

way it is expressed, amplified as it is by the country's competitive politics and First-Amendment outspokenness.

At bottom, the phenomenon has peculiarly American causes, sufficiently entrenched to be immune to the tightening of immigration rules since the 1920s or the varying moral claims of impudent foreigners: 61% of Americans, for example, opposed taking in Jewish children in 1939, slightly more than oppose admitting Syrian refugees now. One is the hope and conviction that the whole point of America is to protect its citizens, fortress-like, from perils and miscreants across the seas. Another is the slow, disconcerting evolution of a mostly white, Christian country to a more secular, patchwork nation.

Historians also speculate that some Americans' intermittent hostility to outsiders is fundamentally religious in another way: a transmutation of a hunch that the devil walks among them, and that the faithful must be ever vigilant for his guises. That, on the other hand, is unlikely to apply to Mr Trump, whose acquaintance with Christianity seems almost as thin as his understanding of Islam. ■

Ivy League to the great public universities of the South and Midwest, student demonstrators have called for the renaming of buildings and academic departments, the removal of artworks and even the scrapping of sports team mascots that celebrate controversial aspects of history. The loudest opposition often involves alumni.

As befits an academy that has sent former students to Congress at every election since 1789, grandes have had much to say about a row at Princeton. That was sparked when students demand the renaming of the university's Woodrow Wilson School of Public and International Affairs, as well as a residential college named for the 28th president, who ran Princeton before entering the White House. Protesters cited Wilson's white supremacist beliefs, and his moves to resegregate the federal government after taking office in 1913. An editorial in the *New York Times* urged university bosses to purge the name of Wilson, an "unapologetic racist". The Republican governor of New Jersey, Chris Christie, told the *Washington Post* he was "disappointed" that Princeton's Board of Trustees is to consider expunging Wilson's name.

On November 23rd the Democratic mayor of New York, Bill de Blasio, said he "absolutely" backed student protesters at Yale—including his son Dante—who want the university to rename a dormitory that currently honours John C. Calhoun, a senator and vice-president from South Carolina whose vocal support for slavery and state's rights helped pave the way for the civil war. Some days earlier authorities at Georgetown University, in Washington, DC, agreed to rename two halls of residence called after school presidents who sold Jesuit-owned slaves in the 1830s.

In Massachusetts, the liberal arts college of Amherst has asked alumni for views on the fate of "Lord Jeff", an unofficial mascot since the 1920s. He is named for Lord Amherst, a colonial governor who suggested, in 1763, that smallpox-infected blankets be used to "extirpate" Native ▶

Universities

What's in a name

WASHINGTON, DC

Students want to rename buildings honouring slaveowners and racists

ON AMERICAN college campuses, money talks. That empowers two very different groups: today's fee-paying students, and graduates of yesteryear, whose affections (and wallets) are sought by their alma maters with an ardour that might make Casanova blush. Pity university chiefs, then, as a wave of campus protests breaks out involving the past. From the



Princeton's studious protesters

► Americans. A poll of present-day students found that 83% would ditch Lord Jeff. To date, just one-third of alumni agree.

At the University of Missouri at Columbia a petition drive calls for the removal of a statue of Thomas Jefferson, which has been adorned with sticky notes reading "racist" and "rapist", in a reference to his ownership of slaves, with one of whom he fathered a child. Awkwardly, the statue was installed in 2000 by members of the university's Jefferson Club, reserved for the most generous donors.

Nor are works of progressive art immune. On November 23rd the University of Kentucky (UK) announced the shrouding of a large fresco depicting the state's history, commissioned by the Depression-era Public Works of Art programme. Painted at a time when the university was all-white, the mural shows black people working in tobacco fields and black musicians playing for a white audience. Two dozen black students told UK bosses that they found it "painful and degrading". ■

Cricket in America

Some corner of Citi Field

HOUSTON

A worthy effort has been made to pep up cricket in America

AMONG cricket's many quirks is the fact that its first international contest was between two countries, America and Canada, that now hardly play the game. Held in New York over three days in September 1844, the match drew up to 20,000 spectators, wagers of over \$100,000 and, though the Canadians won by 23 runs, helped Americanise what had hitherto been considered a preserve of toffee-nosed British expatriates. Within a year, reported the *Herald* newspaper, cricket was "fast progressing throughout the land—in every city, town and hamlet are clubs formed".

A few things, chiefly baseball, have impeded that progress; America's national side, currently ranked 25th in the world, one place below Singapore, has not qualified for a major tournament in a decade. So a three-match veterans tour of New York, Houston and Los Angeles this month by some of the game's biggest stars, including its captains, Shane Warne, a brilliant Australian, and Sachin Tendulkar, the most revered living Indian, was a timely effort to regain influence.

The games, which drew a combined crowd of over 60,000 to three famous baseball venues, Citi Field, Minute Maid Park and Dodger Stadium, were equally a tribute to the influence American sports have had on cricket. They were played using the game's shortest format, T20, a made-for-television hit-a-thon, which in

American marriages

Demand, meet supply

NEW YORK

Most Americans would get married, if only they could find someone suitable

AS A high-powered media executive in New York city, Leah had been wary of marriage. After seeing other women get "mommy-tracked" at work, she was ambivalent about letting children compromise her career. But love has a way of making a hash of plans, and these days she and her husband manage two full-time jobs and the care of their 18-month-old daughter. Leah still works nearly 50 hours a week and earns a bit more than her husband, but she also handles most of the routine caregiving, cooking and cleaning at home. Juggling everything often leaves her feeling "inadequate," she admits, but she chalks it

up to the struggle of trying to have it all. "Rich world problems, right?" she says with a chuckle.

While fewer women are marching to the altar—the proportion of those married before the age of 30 has fallen from 50% in 1960 to around 20% today—the ones that do increasingly look like Leah. Highly educated, financially independent women were once among the least likely to get hitched. Now they are getting married at a faster rate than their lesser-educated peers, and often to highly educated men. These unions are not only the most common, but also the most harmonious. New data show that America's divorce rate has continued its plunge from its 1981 peak—from 5.3 to 3.2 divorces per 1,000 people in 2014—but this decline is largely concentrated among the better-educated. Among college graduates who married in the early 2000s, only around 11% divorced within seven years, according to data from Justin Wolfers of the University of Michigan.

This has created a fairly uneven marriage market. Although the returns to a college education have risen sharply in recent decades, America's college-graduation rate has been inching up slowly, and now hovers at around 40%. Women make up a growing share: those born in 1975, for example, were around 20% more likely to complete a four-year degree than their male counterparts. Meanwhile, women ►

many ways, including its cross-bat hitting and acrobatic fielding, resembles baseball more closely than it does cricket's more cerebral five-day version. In its staging, T20 is similarly lifted from American sport: it features shiny kit, commercial breaks and cheerleaders wearing little behind their pom-poms. When the giant screen at the Minute Maid flashed "Home run!", whenever a player hit a six (which happened a lot, because baseball fields are smaller than cricket grounds), it seemed more informative than ironic.

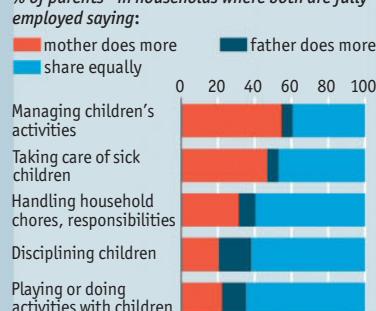
The series was also a tribute to the success of America's 4m citizens of South Asian, chiefly Indian, descent. One of America's fastest-growing groups, its members accounted for virtually every ticket sold, and brought more than a memory of their ancestral cricket fervour to the stadiums. As niche entertainment for the Asian diaspora, T20 could have a solid future in America.

Yet, partly for the same reason, it will be hard to reverse cricket's decline there. As cricket in America has been claimed by Asians and, to a lesser degree, Caribbean islanders its support among whites has shrivelled. A history of maladministration has added to that. The American cricket association is suspended from the game's governing body, the International Cricket Council, because of financial and other improprieties. If these are not redressed, it could be expelled.

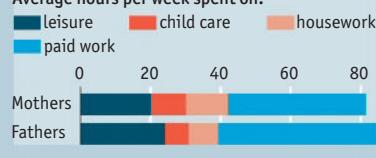
Leave it to Beaver

American families, 2015

% of parents* in households where both are fully-employed saying:



Average hours per week spent on:



► with less education are stuck with a stock of less-appealing men. Women of nearly all levels of education have seen their earning power climb since the 1970s, while the earnings of men without a college degree have fallen between 5% and 25%, according to David Autor and Melanie Wasserman, both economists at MIT. Less-educated men also tend to have more anachronistic views about who should do what at home: they are not only less comfortable with partnerships in which women earn more, they also tend to be less-attentive parents and less helpful around the house than their better-educated peers.

This asymmetry is especially profound for African-American women, whose store of available men has been whittled down further by higher rates of incarceration and mortality. Inter-racial marriage is becoming more common but remains relatively rare. Black women are half as likely as blackmen to marry someone of another hue, according to the Pew Research Centre. Mismatched desires among lesser-educated men and women have shrunk the share of households headed by a married couple from two-thirds in 1960 to less than half today. The proportion of children being raised by a single parent has more than doubled in the past four decades. More than seven in ten births to African-American women are outside marriage.

Here's your whisky, darling

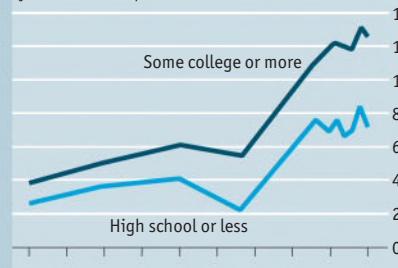
Concentrating gains from marriage at the top has exacerbated existing trends in inequality. On most measures, the children of married couples are already more likely to fare better than those with single parents. But well-educated parents often have more money for schools, safer neighbourhoods and nutritious food, and fewer children to invest in (owing to the higher opportunity cost of child-rearing for career-oriented women). Well-educated parents spend more time with their children than their less-educated peers. For mothers the gap is only a few extra hours a week, but among fathers the difference is considerable: those with a job and a college degree spend more than double the time of less-educated men, according to Jonathan Guryan of Northwestern University and his co-authors.

Having fewer sprogs makes it easier to continue this support through early adulthood, which more parents seem to be doing. Nearly 43% of all young men (ages 18 to 34) and more than a third of all young women have yet to flee the nest, according to a new Pew analysis of census data. This boom in late-bloomers may be another sign of privilege. A recent paper from the New York Fed found that this trend can largely be attributed to the surge in student debt over the past decade or so, and it is better-off children who tend to enroll in college in the first place. Children from

The daddy track

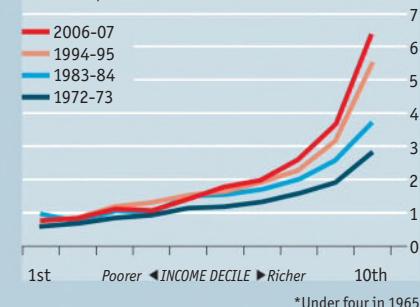
United States

Time fathers spend caring for children under five*
By education, hours per week



Source: Shelly Lundberg and Robert A. Pollak

Spending per child, by household income decile
\$'000, 2008 prices



*Under four in 1965

homes with an annual income of over \$108,650, for example, are nearly twice as likely to enroll than those from homes that make less than \$34,160, according to a report from the Pell Institute for the Study of Opportunity in Higher Education.

Yet while marriage has been transformed, the roles played by each partner in the home have been slower to change. A recent Pew study found that in households where both parents work full time, more of the day-to-day parenting responsibilities fall to women. Mothers are twice as likely as fathers to say that being a working parent has hurt their careers, in no small part because many employers still function according to a single breadwinner model. This is slowly changing, particularly as more women start out-earning men. In couples with two full-time working parents, 26% of women earn around the same amount as their partners, and 22% earn more, according to Pew.

Conservative policymakers often argue that getting poorer women to marry will improve the lot of their children. But programmes to encourage more people to wed never seem to work. This is largely because most Americans are already quite

convinced of the value of marriage, and even poorer people hold the institution in high regard, according to a new survey of public views of the American family from Deseret News and Brigham Young University. Most agree that marriage is the best arrangement for raising children, and many still hope to trade vows one day. Unlike Europeans, who are moving away from marriage, even younger Americans generally expect to put a ring on it, and view cohabitation as a practical step along the way.

The distance between the number of people with favourable views of marriage and the number actually getting married is best explained by this: many of the marriages available do not offer a good deal for women. Yet those who assume the breakdown of the nuclear family reflects a growing crisis of morals might otherwise take heart: the decline in marriage in America has coincided with a similarly precipitous decline in juvenile crime, teenage pregnancy and adolescent drug-use, and fewer children are dropping out of high-school. Those who still hope to woo more people to the altar might keep in mind that the marriage market is ultimately like any market: people buy in if the price is right. ■



Lexington | With Cruz, they'd lose

Ted Cruz, a firebrand Republican, peddles a self-serving myth about presidential contests



THE presidential candidate who has most harmed American politics this year is Donald Trump, a bully who has prospered by inciting rage. Yet from the narrower perspective of the Republican Party, the most dangerous candidate of the 2016 pack may just be Senator Ted Cruz of Texas, who is rising in the polls by telling conservative activists a seductive but misleading story about how their party wins elections.

Since launching his presidential run, the 44-year-old Texan has built his campaign around a simple pitch: assuring the most conservative third of the Republican electorate, from born-again Christian voters to hardline members of the Tea Party, that they form a natural majority of the conservative movement, and indeed would decide general elections if they would only turn out and vote. In his telling, this stirring truth frightens a cowardly Republican establishment in Washington, which urges conservatives to run to the middle as "Democrats-lite"—whereupon, Mr Cruz argues, "We get whipped." By way of proof, the first-term senator informs Republican crowds that in 2012, when the party nominated Mitt Romney, roughly half of all born-again Christian voters and millions of blue-collar conservatives stayed home.

New polls show Mr Cruz rising to second place behind Mr Trump in Iowa, which will hold the first contest of the presidential primary season on February 1st. Much of his surge is at the expense of Mr Trump's fellow-outsider, the retired neurosurgeon Ben Carson. Dr Carson, a devout Christian whose memoirs are a staple for church book-clubs and home-school curriculums, led some Iowa surveys in October. But the doctor has been hurt by amateurish responses to the Paris terror attacks, including a breezy suggestion that a "great nation" like America should not be "afraid" to shoot down Russian planes over Syria, if need be.

Prayerful Republicans have won Iowa in the past and faded soon afterwards, it is true. But Mr Cruz sees openings. The 2016 presidential primary calendar is front-loaded with conservative, pious states, many in the South, allowing Cruz strategists to dream of swiftly dominating the "very conservative" lane of the race, while establishment rivals squabble among themselves. And as Mr Trump's campaign has taken a more thuggish turn, Mr Cruz has gingerly distanced himself, saying that Republican candidates should remember that "tone matters". What Mr Cruz will

never do is criticise Mr Trump's angriest supporters, for he hopes to inherit them one day. Instead he presents himself as angry America's champion in Washington. He calls Barack Obama "an apologist for radical Islamic terrorism", and has challenged the president to debate the wisdom of admitting Syrian Muslim refugees to America, a plan that Mr Cruz calls "lunacy".

On November 20th Mr Cruz and six Republican rivals attended a presidential forum in Des Moines hosted by the Family Leader, a social-conservative outfit. A blizzard did not stop 1,200 locals from attending the hustings, which saw the politicians ranged around a mock Thanksgiving dinner table. The Family Leader's boss, Bob Vander Plaats, set the tone by telling the gathering that "Satan was trying to disrupt our plans tonight" with the snowstorm and other wiles, but that this merely proved that the meeting would be "something special". The crowd responded warmly to Mr Cruz, who offered stories about religion's importance in his life, scorn for Mr Obama and exhortations for Christian conservatives to defy "Washington" and unite around a single candidate, or as he put it: "If the body of Christ rises up as one and votes our values, we can turn this country around."

On paper, Mr Cruz makes an unlikely warrior against elitism. Before entering Texas politics, he was a debating champion at Princeton and a star student at Harvard Law School, later securing a high-flying post as a clerk at the Supreme Court. His wife, Heidi, worked at the National Security Council under President George W. Bush, then for Goldman Sachs, a bank. Supporters are unfussed. They praise Mr Cruz as a "fighter" who battled Democrats and also his own party leaders in Congress, notably when he forced a government shutdown in 2013 in what he called a bid to derail Obamacare. Fans do not care that other Republican senators angrily call the shutdown a doomed scheme whose purpose was to cast Mr Cruz as a grassroots hero. To the grassroots, being disliked in Washington is a character reference.

John Wacker, a manufacturing engineer, recalled being reluctant to put out campaign signs for Mr Romney in 2012 and for the Republican nominee in 2008, Senator John McCain. "They didn't inspire me," Mr Wacker explained, before praising Mr Cruz's "charisma". Several at the forum relished the prospect of the senator in a presidential debate with Hillary Clinton. "He'd eat her for lunch," growled David, a campaign volunteer who declined to give his last name, citing his distrust of the press. As for Mr Vander Plaats, his organisation will endorse a candidate before Christmas. But he predicts in a telephone interview that Mrs Clinton is beatable "if we can choose someone who can inspire our base", adding: "When we choose the mushy middle, we lose."

Remember Barry Goldwater? He lost 44 states

Alas for Cruz fans, the senator's story about a Republican voter strike in 2012 does not add up. Turnout fell among lots of groups in 2012, some of them Obama-friendly. Moreover, turnout actually rose in some of the most closely-fought states. Voting rates also remained pretty healthy among white Protestant evangelicals, who made up one in four of all voters according to exit polls, though they account for only 19% of the population. Conservative Cruz fans may not care, for now. His fable about how elections are won flatters them, after all. As Mr Cruz beamed in Des Moines: "The men and women in this room scare the living daylights out of Washington." But it is a fable: no Republican has won the White House without hefty moderate support. Mr Cruz is a clever and eloquent man. All the more reason to beware him. ■

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Argentina's new president

The end of populism

BUENOS AIRES

Mauricio Macri's victory could transform his country and the region

CAR horns blared. Firecrackers lit up the sky. Yells of "Vamos!" rang out among Buenos Aires's Parisian-style apartment buildings. The revellers were acting like football fans, but the win they were cheering on November 22nd was political. It was the upset victory of Mauricio Macri, the mayor of the city of Buenos Aires, in a run-off election to become Argentina's next president. Even more than most presidential transitions, Mr Macri's triumph will begin a new era for the country, and perhaps for South America as a whole.

He takes over from Cristina Fernández de Kirchner, who together with her late husband, Néstor Kirchner, governed for 12 years with a defiant populism that distorted the economy, made enemies at home and abroad and undermined institutions. Ms Fernández leaves her successor with an economy that has barely grown for four years, dwindling foreign-exchange reserves, inflation of around 25% and a budget deficit of more than 6% of GDP.

Mr Macri's defeated rival, Daniel Scioli, shared Ms Fernández's Peronist pedigree and ran as her heir. But even he would have reversed many of her policies; the parlous state of the economy would have left him with little choice. With Mr Macri, the first elected president in nearly a century who is neither a Peronist nor affiliated with the movement's weaker rival, the Radical Civic Union, reform is likely to be

faster and more profound. He campaigned under the banner of Cambiemos ("Let's Change"), a coalition of mainly centrist non-Peronist parties. After a dozen years of kirchnerismo, he promises a return to economic sanity, diplomatic prudence and a more accountable democracy.

The son of an Italian-born businessman who grew rich on government connections, Mr Macri is an unlikely president, aloof and sometimes almost inarticulate. But he has shown himself to be a good manager and a dogged campaigner. Politically, he is a self-made man. He first came to public notice as a successful president of Boca Juniors, the country's most popular football club. In a decade he has built a party—Republican Proposal—from scratch.

Technocrats to the rescue

Change will be evident as soon as Mr Macri takes office on December 10th, starting with a new way of governing. He is a more collegial executive than Ms Fernández, although he lacks her charisma. At his post-election press conference—itself a sign of greater openness—he suggested he would move quickly to restore professionalism to institutions that the Kirchners had tried to bring to heel. He will shake up the statistics agency, which has been churning out misleading reports on inflation and none on poverty. He plans to replace the governor of the Central Bank, who has been obedi-

Also in this section

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34 A Brazilian environmental disaster

34 Car safety in Latin America

ently printing money to finance the budget deficit.

Mr Macri has said that he will disperse power away from Ms Fernández's super-ministries of economy and production. He is choosing well-regarded technocrats to fill the top economic jobs. Alfonso Prat-Gay, a former Central Bank governor, is to be the head of a still-weighty finance ministry. Federico Sturzenegger, a congressman and economist, will take charge of the Central Bank. Mr Macri's choice for education, Esteban Bullrich, commands respect for having reduced the number of teachers' strikes in Buenos Aires. All the city's teachers have his mobile-phone number.

To reorient Argentina's diplomacy, Mr Macri has named Susana Malcorra, a little-known UN official, as foreign minister. The new president wants to repair relations with the United States and European countries, which Ms Fernández snubbed in favour of friendship with authoritarian regimes such as those of Russia, Iran and China. Mercosur, a six-nation trade grouping including Brazil, is likely to be more open to agreements with other trade partners than it has been under the Kirchners. Mr Macri will be a bolder advocate of democracy in South America than his fellow leaders are: he has already said that Venezuela should be suspended from Mercosur if it fails to conduct fair parliamentary elections on December 6th and to release opposition leaders from jail.

His most urgent task is to fix the economy. Ms Fernández kept it limping along by means of "patches", quick fixes such as a currency swap with China to replenish foreign-exchange reserves. These have been depleted by debt payments and by spending to support an overvalued exchange rate, which gives Argentines an illusion of prosperity but throttles exports. ►

► Liquid reserves are probably much lower than the \$26 billion the government reports. Last week an oil tanker was left tossing for days off Bahía Blanca because the government could not pay for the cargo. "It's extraordinary that the economy is on the verge of crisis and people don't feel it," says Miguel Kiguel, an economist.

Mr Macri faces three big and interlinked tasks: removing economic distortions, balancing fiscal accounts and restoring normal financial relations with the outside world. The immediate priorities are to boost the Central Bank's reserves, unify the exchange rate and lift exchange con-

trols. An adviser to the new president says that lifting exchange controls and removing export taxes will encourage farmers to sell crops they have hoarded; this could bring in up to \$9 billion to the Central Bank, says Luis Miguel Etchevehere of the Rural Society, a farmers' lobby (see Bello). Rather than turn to the IMF for support, a political non-starter, the new team will look for other emergency sources of foreign funds. They are expected to try to end Argentina's isolation from international credit markets by seeking an agreement with bondholders who pushed the country into default last year.

"The challenge is getting the sequencing right," the adviser admits. Devaluing and freeing the peso without reserves risks an inflationary plunge in its value. But the key to raising reserves is a more realistic exchange rate. In victory Mr Macri was more cautious than as a candidate. Exchange controls will be lifted "once the situation is normalised", he said.

Raising funds abroad would also give the new government more time to close the fiscal deficit. It will be lumbered with a swollen bureaucracy and indexed spending on benefits which will take time to reform. It can move more quickly to cut ener- ►

Bello | Down by the riverside

Rosario embodies much of the best and some of the worst of Argentina

SUCH is the domination of Argentina by Buenos Aires that one study of the country's history is subtitled "A City and a Nation". Keen to find a non-metropolitan perspective on the country's presidential election and its prospects, Bello headed out of the capital. A four-hour ride northwest on a monotonously straight motorway in a bus that, like much in Argentina, had seen better days took him to Rosario, the third-largest city, with 1.3m people.

Most big cities in Spanish-speaking America were founded by a conquistador. But Rosario just sprang up, in the mid-19th century. It owes everything to geography; its site is where the railway across the *pampa húmeda*, the rain-fed heart of the world's most bounteous farmland, meets the broad, brown and navigable Paraná river.

This means that Rosario has no aristocracy but rather a bourgeoisie, based on family businesses, says Gerardo Bongiovanni, who runs Fundación Libertad, a liberal think-tank in the city. Both the city and the surrounding province of Santa Fe have been relatively well-governed since the 1980s, he adds. Rosario, and now the province, is a bastion of the Socialist Party, a moderate and non-populist grouping that models itself on its namesake in Spain. Argentines know the city as a centre of culture and a nursery of footballers—Lionel Messi, Ángel di María and Javier Mascherano, the brightest stars of the national team, were born there or nearby.

Rosario's residually elegant tree-lined avenues of Belle Époque houses are testament to its golden age as a grain port a century ago. Today it is Argentina's agro-industrial capital. The world's biggest and most efficient cluster of oilseed-crushing plants stretches for 80km (50 miles) along the Paraná. Rosario has therefore suffered from President Cristina Fernández de



Kirchner's policy of squeezing farmers to benefit her clientele in the cities. Soya exports, for example, are subject to a 35% "retention" imposed in 2007 after world prices rose. Farmers suffer, too, from the overvalued peso.

At the vast crushing plant of Louis Dreyfus Commodities, a European firm, soya-beans are transformed into meal, oil and biodiesel and loaded into oceangoing ships at two wharves on the Paraná. It is a world-class operation, involving an investment of \$700m, but it runs at only around 65% of capacity, says Diego Pereyra, the head of Dreyfus's oilseeds division. For that, blame the "retentions": after quadrupling in the decade to 2007, Argentina's production has grown much less quickly.

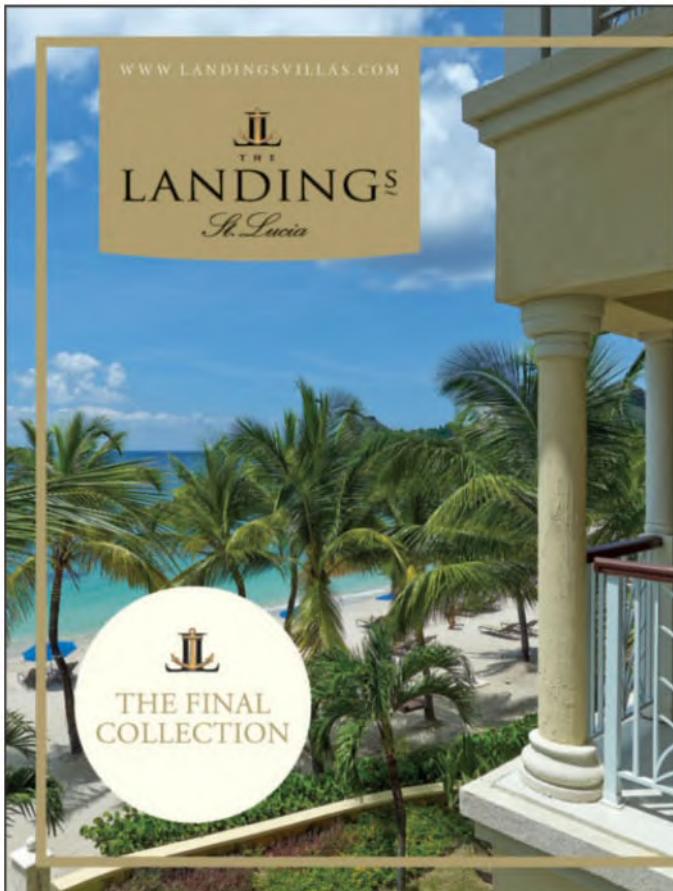
What makes farmers even more furious is that they see little return from their taxes. Under Ms Fernández, the total number of public employees, pensioners and welfare beneficiaries has almost doubled. But investment in infrastructure has languished. An upgrade of the railway from Rosario to the north-west is only a third complete. Ms Fernández's anti-business policies mean that private investment has slumped, too.

The results can be seen in the *villas*, the poor districts surrounding Rosario that are home to hundreds of thousands of migrants from Argentina's poor northern provinces. Neither urban development nor employment has kept pace. Into this vacuum has stepped the drug trade. Rosario has become the entrepôt for cocaine from Bolivia and Peru heading for Europe. Many residents in the *villas* have become consumers, especially of *paco* (cheap semi-processed cocaine). A country that once boasted the best schools in Latin America now sees many children dropping out, some to become *soldaditos* ("little soldiers"), as the runners and hired killers of the drug trade are known.

The result is that Rosario saw the highest murder rate in Argentina in 2013. Organised crime has penetrated the police; in an incident in 2013 that shocked the country, hitmen fired a dozen gunshots at the home of the provincial governor. "Rosarinos have changed their habits. They stay at home. They've lost their freedom," says Gabriel Chumpitaz, a local councillor for the party of Mauricio Macri, the president-elect.

Miguel Lifschitz, the incoming governor of Santa Fe, is confident that crime will fall. A score of police commanders are in jail, and the province is setting up a criminal intelligence squad. He expects more help from Mr Macri than the province received from Ms Fernández.

Farmers, too, expect better times. Mr Macri has promised to cut the retentions on soya by five points a year and remove them on other crops, as well as scrapping export controls and unifying the exchange rate. Farming will respond quickly to neutral policies with higher output, its leaders say. "I am more excited than at any time since [the return of democracy in] 1983," declares Mr Bongiovanni.



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gy and transport subsidies which go to rich and poor alike: on average, Argentines pay just \$9 a month for electricity. But Argentina has never managed to cut its fiscal deficit by more than one percentage point of GDP per year, notes Luis Secco of Perspectiv@s, a consultancy.

All this will inflict pain in the short-term. Barclays, a bank, expects an economic contraction next year (of 1.1%) before a rebound in 2017. "The big danger is social unrest," says Mr Kiguel. Mr Macri's narrow victory means that he will have to build a mandate for radical change. "The first package will have to be more centre-left than centre-right," says the adviser, acknowledging the political constraints. The Peronists control the Senate; they must be persuaded to repeal laws that prevent a deal with the holdouts.

But the new president has some high cards to play. The Peronist governors, who have influence in the Senate, are a pragmatic bunch; many of them need support from the central government to restructure their debts. Argentina's isolation from the capital markets means that it is barely indebted. If Mr Macri restores confidence by governing in a transparent and predictable manner, money could emerge from mattresses and flow back home from foreign bank accounts.

He knows it will not be easy. The peroration to his post-election speech at a convention centre on the River Plate was a plea, not a victory cry. "I'm here because you got me here," he told his cheering supporters. "So I ask you: please don't abandon me." ■

Road deaths in Latin America

Safety second

BOGOTÁ

The macho approach to air bags is fading

DELEGATES at the world conference on road safety in Brasilia in November had a chance to try out the latest devices, such as automatic emergency braking systems. Outside the conference venue, they would have had a hard time finding such lifesavers. Latin America's transport regulators are at least a decade behind those of developed countries in mandating safety equipment for cars. But they are making progress.

The death rate on the region's roads is high: the safest Latin American countries are three times more dangerous than Switzerland. But drivers have little interest in safer cars, and sellers lobby governments not to require them. For consumers newly promoted to the middle class, airbags and anti-lock braking systems (ABS) seem like luxuries. Cars equipped with such devices typically come with fripperies like sunroofs and leather seats. In Mexico, a Chevrolet Aveo with front-seat airbags costs \$3,000 more than a pared-down version, the country's bestselling car. That model recently had the lowest possible score in a crash test conducted by Latin NCAP, a group that promotes car safety.

Manufacturers and importers exert

Slow motion

Car-safety features

2015

Country	Double air bags	Anti-lock braking system	Electronic stability control
Argentina	✓	✓	-
Bolivia	-	-	-
Brazil	✓	✓	-
Colombia*	✓	✓	-
Ecuador†	✓	✓	✓
Mexico	-	-	-
Peru	-	-	-
Uruguay‡	✓	✓	-
Venezuela	-	-	-

✓ Compulsory
- Optional

*From 2017 †From 2016

Source: *The Economist*

‡To be completed by 2016

"enormous pressure" on regulators to avoid having to install additional safety features, says Alejandro Furas of Latin NCAP. They claim that devices such as airbags and ABS would push up the price of an entry-level car by \$2,000 on average. Such arguments carry weight with regulators. Mexico, the world's fourth-largest exporter of cars and parts (mainly to the safety-conscious United States and Europe) does not even require seatbelts and child restraints in cars sold domestically.

Although seatbelts are the most effective safety devices, newer ones also save lives. Front-seat airbags reduce the odds of dying in a potentially fatal crash by 11% when a passenger is wearing a seatbelt and by 14% when he or she is not, according to the United States' National Highway Traffic Safety Administration. ABS have a mixed record: they increase the number of cars that run off the road but reduce collisions with pedestrians. In conjunction with electronic stability control, a newer-fangled technology, ABS should reduce fatal crashes by 15%.

Latin American regulators are overcoming resistance to higher standards. In Brazil, double airbags and ABS have been mandatory in new cars since 2014 (see chart). Uruguay started to implement the same requirement last year. There extra equipment raised the average price of a car by just \$300, far less than manufacturers warned. Colombia had planned more ambitious requirements, including electronic stability control, but retreated under pressure from the industry. In October its transport ministry issued a more modest requirement: from 2017 new cars will have to be equipped with airbags, ABS and headrests (to protect against whiplash).

The new rules leave plenty of wriggle-room. They are merely a framework, and do not set down technical specifications, points out Oliverio García, of Colombia's car importers' association. Headrests will be mandatory, but "Can they be made of polystyrene?" he wonders. Car safety in Latin America still has a long way to go. ■



Soiling the sea

Two weeks after bursting through a dam used to contain more than 40m cubic metres of waste from an iron-ore mine in south-eastern Brazil on November 5th, the sludge began to reach the Atlantic Ocean. At least 12 people died in the accident, more than 600 were displaced and parts of the nearby town of Mariana were swept away. The pollutants will damage fish and forests along the lower three-quarters of the Doce river and could soil a 10km (six-mile) stretch of coastline. The environment minister, Izabella Teixeira, calls the accident the country's "worst-ever environmental disaster".



Politics and death in Bangladesh

The noose tightens

DHAKA

The opposition is floundering as Sheikh Hasina has her way

THE trapdoor that opened in Dhaka, the Bangladeshi capital, early on November 22nd not only ended, by hanging, the lives of two prominent opposition figures. It also brought nearer to a close the work of the International Crimes Tribunal, a domestic court which the prime minister, Sheikh Hasina, set up over five years ago to prosecute heinous crimes committed during the country's war of secession from Pakistan in 1971.

A proper accounting of that war's atrocities was needed. But the tribunal was flawed. It flagrantly violated defendants' rights and was susceptible to political meddling. For Sheikh Hasina, however, it has all been worthwhile. She has settled scores that date back to the struggle for independence. And she has gravely damaged the opposition Bangladesh Nationalist Party (BNP) run by her arch-enemy, Khaleda Zia.

Telling no tales

The first of the two dead men, Salauddin Quader Chowdhury, came from a well-connected family. His politician father had, before independence, acted on occasion as Pakistan's president when the strongman, Ayub Khan, was absent. Mr Chowdhury himself was close to Mrs Zia, twice prime minister, and was often seen as Bangladesh's go-between with Pakistan.

The tribunal found him guilty of charges that included, in 1971, wiping out Hindus in cahoots with the Pakistani army. Yet the trial was not fair. The prosecution was

allowed to summon 41 witnesses, the defence only four. The court barred testimony from a former American ambassador, among other notables. Their affidavits claimed Mr Chowdhury was in Pakistan at the time of the alleged crimes.

The second man, Ali Ahsan Mohammad Mojaheed, was the secretary-general of an Islamist party, Jamaat-e-Islami, the BNP's partner when it was last in power—he was minister for social welfare. Mr Mojaheed was convicted of organising the murders of intellectuals and Hindus in 1971 as a senior commander of Al-Badr, a notorious paramilitary outfit that recruited from Jamaat's student wing and went after Bengali nationalists. Many Bangladeshis have welcomed the hangings. Sheikh Hasina, daughter of Bangladesh's founding father, Sheikh Mujibur Rahman, can now say that she has kept her 2009 election promise to punish those guilty of atrocities.

Meanwhile Mrs Zia (the widow of Ziaur Rahman, who rose to power after Sheikh Mujib's assassination in 1975, before his own assassination in 1981) returned this week from a stay in London. The authorities made her plane circle over Dhaka as her supporters were shooed away on the ground. Her dynasty is looking increasingly without purpose. The lady herself, though only 70, is showing signs of frailty. Her son and political heir, Tarique Rahman, is unable to return from London because of corruption charges against him from the time of his mother's kleptocratic

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administration. Party insiders describe a messy succession. A former leader laments Mr Rahman's "wide and dangerous tentacles", and the party's inability to respond to its altered circumstances. Too readily it calls out thugs to stir up violence.

Though it has strong rural support, the BNP is losing its powers of business patronage. It has no MPs, having boycotted the last election. The next one is not until 2019, and if Sheikh Hasina has her way it will, like the last, not be overseen by a caretaker government to ensure fair play. Meanwhile Sheikh Hasina's Awami League continues, just as the BNP did in power, to hound opposition politicians. Many are in jail, while others have fled or gone into hiding (Mrs Zia also faces many charges of graft). Of those left standing, some dream of a future without Mr Rahman. On November 20th Nazmul Huda, a former BNP bigwig, announced a breakaway Trinamool (or "grassroots") BNP.

The BNP's problems go beyond a tainted heir-apparent. The party appears unable to reassure India, the giant neighbour, that Bangladesh's secular traditions are safe under a future BNP government. It does not help that the BNP is reluctant to sever ties with Jamaat, which promotes a Saudi-influenced Islam (and which may soon be outlawed). Meanwhile, ties between the Awami League and India are getting ever closer. This month Bangladesh fulfilled the last in a long list of Indian demands when it handed over Anup Chetia, a separatist leader from Assam whom Bangladesh had kept in jail for 18 years as a useful bargaining chip.

Municipal elections in December may provide a fillip to the BNP. But nearly everywhere the Awami League's dominance grows. The cost to Bangladesh's democratic and legal institutions—which the country's founding was supposed to entrench—is another matter. ■

Sikhism in India

Seeking justice

AMRITSAR

What sounds like a religious schism in Punjab could be a cry for better political leadership

THE Sikh religion provides for a gathering of believers, the Sarbat Khalsa, in times of great crisis. It was convened regularly in the 18th century, when the Mughal empire was trying to exterminate the Sikhs. But it was called just twice in the 20th century. The last time was in 1986, as a response to bloodshed that began with the Indian army's assault on the Sikhs' Golden Temple in Amritsar to flush out Sikh militants, some calling for their own Khalistan ("land of the pure"). It culminated in the murder of Indira Gandhi by her Sikh bodyguards and—in mob revenge—of thousands of innocent Sikhs in Delhi.

And so a tremor was felt in the state of Punjab when a Sarbat Khalsa was called for November 10th, to be held on an unassuming patch of ground outside Amritsar. Its topic was blasphemy and the desecration of the Sikhs' holy book: torn pages had been showing up around the state for weeks. On the day itself the ground shook, when as many as 100,000 people gathered (see picture). The meeting concluded by calling for the ousting of the three high priests of Punjab's most important temples or gurdwaras. One of the chosen replacements happens to be a pro-Khalistan separatist, in jail for assassinating a chief minister of Punjab in 1995.

The present state government is led by a father-son duo of Parkash and Sukhbir Singh Badal and their Shiromani Akali Dal (SAD) party. They took the whole thing as an affront. It was instigated, they huffed, by criminals, by the allegedly anti-Sikh Con-

gress party and by "foreign elements"—meaning either Pakistan over the border or Sikhs with separatist leanings in the West. The Badals understand that they and not the religious leaders were the real target—for their family is widely thought to control the *gurdwara* committee that appoints the priests. On November 23rd Sukhbir Singh Badal led a huge counter-rally of supporters through the impoverished southern part of the state. The SAD's procession was met by cheering crowds and none of the black flags of protest that had been promised. It was as if the religious fire of the Sarbat Khalsa had blown out.

Certainly, few in Punjab want another fight for an independent Khalistan for Sikhs. The state has desperate problems, but they are not religious in nature. Farming is in steep decline as short-sighted policies have depleted the water table and encouraged the cultivation of unsuitable crops. This year fake pesticide brought infestations of whitefly to the cotton crop. Not long ago Punjab was relatively rich, its farming prosperous; but today it ranks 12th among India's states in GDP per person. There is little industry. The police spend their days shaking down motorists; educated Punjabis look abroad for work. Social ills have sprouted, drugs worst of all.

Few seem happy with the Badals. Their many businesses have thrived, though little else does. Their electoral hold on the state is helped by the fact that not only are they Sikhs, like most of Punjab's population, but they are from the Jat Sikh caste,

the majority within the community. Their political opponents are in chaos. Congress, the party of the Nehru-Gandhi dynasty, is especially weak in Punjab, tarnished by the massacres of the 1980s, while myriad small parties have failed to coalesce. Yet the Badals feel sufficiently threatened by the prospect of assembly elections in 2016 that they are reaching for new sources of strength. So SAD seems to have manipulated Sikhism's high priests into a series of reversals over a charge of blasphemy lodged against a populist preacher. Party leaders might have hoped to attract the flock of Gurmeet Ram Rahim Singh, whose self-promotional videos are wacky beyond belief; but that proved too much for their orthodox base.

In early Sikhism, church and state were figured like a pair of joined swords. In the 17th century it seemed natural that the best men should rule both worlds. But with a political leadership that looks wobbly, and an anarchic opposition, the ruling party's control of religious authority raises stakes to an uncomfortable degree. Radicals may dream of putting a terrorist at the summit of Sikhism. Nearly everyone else just wants a better life, free of fake pesticides. ■

Climate diplomacy in South-East Asia

Best-laid plans

SAMARINDA

The region gets tough on carbon emissions. Or so it says

COAL barges dominate the river traffic in Samarinda, a sprawling Indonesian city on the island of Borneo. The coal is mined a few miles upriver, scarring the land with craters and toxic lagoons. The digging at one mine has gone on for a decade and gobble up vast tracts of farmland, says Sapinah, a farmer who frets at the earthworks creeping in the direction of her home.

All eyes are on what big countries, starting with America and China, commit to do towards cooling the planet at the climate conference which begins in Paris on November 30th. But the promises made by lesser emitters of carbon dioxide matter too—not least the ten countries that make up the Association of South-East Asian Nations (ASEAN). The bloc's carbon emissions are just 7.4% of the global total. But with emissions increasing by 5-6% a year, says Ancha Srinivasan of the Asian Development Bank, they are among the fastest-growing in the world.

ASEAN's challenge is to find cheap and clean ways to meet a demand for energy that grew by half between 2000 and 2013. A further increase of perhaps 80% is ex- ►



Peeved in Punjab



Dirty, but really cheap

pected by 2040, mostly to be met by burning more coal from massive mines in places such as Samarinda to generate electricity. A second worry is deforestation to make way for agriculture and town-building. Deforestation accounts for up to half the region's emissions. Fires started in order to clear land make Indonesia the world's fifth-biggest emitter of greenhouse gases.

Most ASEAN members submitted proposals to cut emissions for discussion in Paris. These typically include two targets: what cuts South-East Asian nations can achieve without outside help, and what further cuts foreign cash might bring about. For example, Indonesia reckons it can cut emissions by 29% by 2030, as measured against a "business as usual" scenario—but up to 41% with foreign financing. Vietnam, which plans to build a string of coal-fired power plants to support its expanding economy, promises only an 8% cut by 2030, rising to 25% with foreign cash.

The pledges are a step in the right direction. But there are caveats. The "business as usual" baseline is a slippery measure, says Taryn Fransen of the World Resources Institute, an American think-tank. And some countries have released only limited information about how proposed cuts will be achieved. A proposal from the Philippines suggests a hefty reduction of 70% in emissions by 2030, but the details are vague and the cuts appear to be wholly conditional on receiving foreign support.

Then there is the question of government capacity or political will to hit climate targets regardless of whether foreign money flows. Indonesia's annual forest

Correction: In last week's Banyan ("She once was lost"), we misrepresented the first name of Fernando Poe. We also were wrong in describing the husband of Grace Poe as a Philippine-born American. He is an American-born Filipino. We are very sorry.

Kim Young-sam, 1927-2015

Dusk to dawn

SEOUL

South Korea's first civilian president in 30 years has died at the age of 87

WHEN nearly 200 women at a bankrupt wig factory were fired in 1979 and then beaten by police for refusing to leave, it was Kim Young-sam who sheltered them in the headquarters of his opposition New Democratic Party (NDP). When more police stormed his offices (and one of the women died), his calls for an end to South Korea's military dictatorship grew noisier.

For Park Chung-hee, who rose to power in a coup in 1961, the noises became too loud. Park suspended Mr Kim's leadership of the NDP and expelled him from the National Assembly. "You can wring the rooster's neck," Mr Kim retorted, "but dawn will still come." All 66 of the party's MPs resigned. Protests followed, the biggest of Park's rule. (Soon after, Park was assassinated by his security chief, during a row about the protests.)

Mr Kim shone in championing the rights of labourers, but a former minister in his government remembers him as "prince of the conservatives". His father grew rich from the anchovy trade. His own backers were from South Korea's growing middle classes. He was ambitious, becoming the youngest MP in the then-tame assembly at the age of 26. Later, in 1996, when he was president, South Korea joined the OECD, the club for rich democracies.

He was a shrewd politician. He missed his first shot at the presidency in 1987, when South Korea held its first free and fair elections in decades. He ran against Kim Dae-jung, a longtime ally in the democratic movement, and split the opposition vote. This allowed a former general, Roh Tae-woo, to win the presidency. Ahead of the next vote in 1992, Mr Kim merged his party with Mr Roh's. He won that election with backing from military strongmen. Many democrats felt betrayed. (And today that merged party is the vehicle for Park's daughter, President Park Geun-hye.)

Yet within months Mr Kim purged a clique of officers who still held senior

government posts. Sending the army back to the barracks, says Kang Won-taeck of Seoul National University, probably averted yet another coup.

Mr Kim hounded the corrupt. He disclosed his wealth, a first, and put Mr Roh and Chun Doo-hwan, a former military dictator, on trial for bribery (and, later, mutiny and treason). Today South Koreans associate Mr Kim with a steaming bowl of *kalguksu*, the humble noodle dish that he served up in place of lavish banquets. He promised South Koreans a presidential office that would be their "good neighbour".

Alas, he left office on a low. His own son went to prison for graft. He bungled his response to the painful Asian financial crisis in 1997 and was long remembered for accepting, in the final weeks of his presidency, what many saw as a humiliating international bail-out.

Yet even detractors mourned his death on November 22nd, recalling when South Koreans became free to criticise their leaders. Under Mr Kim, free speech flourished: one art gallery in Seoul displayed little loudspeakers arranged in the shape of the president's face and played the soundtrack of a porn film through them. Mr Kim wisely ignored the show.



A democrat departs

fires have not been much reduced by a series of stern-sounding laws and moratoriums. Tran Thi Thanh Thuy, an environmental activist in Vietnam, complains that her country's laws on energy and adapting to climate change are notable for their poor implementation.

Shobhakar Dhakal from the Asian Institute of Technology in Thailand says the region's proposed decarbonisation plans

are only a starting point for negotiations. For now they will do little to help limit a rise in global temperatures to two degrees Celsius, which the scientific consensus says is needed to prevent the worst effects of climate change. South-East Asia's low-lying cities and typhoon-battered islands would be greatly at risk from runaway warming. The time to be making difficult decisions—and stick to them—is now. ■

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Shanxi province

King Coal's misrule

DATONG

The rise and fall of a corrupt coal-fuelled economy

IT TAKES half an hour to walk down 1,400 rickety wooden steps from a pithead of Jinhuagong mine to the coal face, 400 metres below. At the top, grimy miners tramp home. At the bottom stand a theodolite, a flame-proof telephone and a double-drum electrical traction shearer—a behemoth of a machine designed to chew up the coal face and excrete its fragments onto a conveyor belt.

But the pithead, in the northern province of Shanxi near its coal capital, Datong, is not operational. It was closed in 2012 and converted into a tourist attraction (with a theme: “the glory of Datong coal”). Perhaps put off by the trek, on most days visitors are rare. The mine’s state-owned operator, Datong Coal Mining Group, is trying to revive its fortunes by diversifying into tourism. It is not proving easy. Its fumbled attempts to reinvent itself symbolise the problems Shanxi as a whole is facing.

As China slows, many economists pin their hopes for continued growth on poorer inland provinces. By taking advantage of cheap labour and land, the theory goes, these places should be able to grow more quickly than richer coastal areas. Shanxi, 250 miles (400km) east of Beijing, would seem a good candidate for catch-up growth. It is relatively poor, with a GDP per person of 35,000 yuan (\$5,500), or 75% of



the national average. It has a population of 36m people, about the same as Canada’s, as well as respected universities and good transport links with the coast. It ought to be steaming ahead. Instead, last year, it had the slowest growth of any province: just 4.9%. In the first nine months of 2015, this slowed to only 2.8% compared with the same period a year earlier. Only Liaoning province in the north-eastern rustbelt fared worse.

Three factors explain Shanxi’s failings: coal, corruption and construction. The province is the historic centre of China’s coal industry. Though its output was over-

taken by that of neighbouring Inner Mongolia in 2009, Shanxi still produces a quarter of the country’s coal. About 60% of provincial GDP is tied to the black stuff.

The business boomed in the 2000s thanks to soaring energy demand (see chart) and the freeing of coal prices, which had been kept artificially low. But the boom was short-lived. Worried by pollution, the central government began trying to reduce China’s coal use. Shanxi has been taking the hit. Capital investment in the province’s coal industry fell last year by 6%. The local government says it will not approve construction of new mines for the next five years. But shrugging off coal dependence is hard. Ignoring its own pledge, Shanxi approved 24 new coal projects in the first nine months of this year, more than any other province.

And now prices are falling as China’s economy slows and the drivers of growth change to less-coal-consuming ones, such as services. China’s benchmark coal price was 374 yuan a tonne at the end of October, a 27% decline so far this year. Local prices for unwashed, low-quality coal have fallen further still. Because so many of Shanxi’s mines are old they are relatively expensive to run. Most are losing money.

The response has been a wave of consolidation. In 2008 the province had 2,600 coal mines. Many of these were small privately owned collieries, at which safety standards were usually atrocious. Most of the private ones have been closed or taken over by state-owned enterprises (SOEs). The number of mines has fallen by almost two-thirds. Safety standards have improved considerably.

But three-quarters of provincial output now comes from SOEs—with predictable ➤

► results. Gone is the entrepreneurial vigour that the private sector once gave the industry, say locals involved in the business. State firms are reverting to type: keeping everyone they can on the payroll, squeezing wages, and hoping the provincial government will bail them out.

It won't. This is because Shanxi, as well as being the capital of coal, is the centre of President Xi Jinping's anti-corruption campaign. Since 2013, seven of the 13 members of Shanxi's Communist Party committee (the province's leaders, basically) have been arrested or charged with "infractions of party discipline", a term that usually means taking bribes. In all, 50 high-ranking officials have been placed under investigation for graft. For its size, the province has had more leaders arrested or jailed than anywhere else.

Corruption, coal and politics have long been inextricably linked in Shanxi. In 2014 Caixin, a magazine in Beijing, investigated Luliang county in the west of the province. It found that coal bosses there were spending \$150,000 a year on bribes; one county-government job had changed hands for \$650,000.

Though corruption was bad, the campaign against it is also taking a toll. Wang Rulin, Shanxi's party chief, complains that he cannot fill about 300 local-government posts because people are too scared to apply—or they think that party jobs are not worth having now they have to be clean. One executive in the coal industry complains that officials "used to take money and help us; now they don't take money and don't help either."

The hangover from cosy relations between coal and politics is visible in the form of half-constructed residential blocks, which loom over the outskirts of even the smallest town. During the boom of the 2000s, coal bosses and local officials got together to pour money into house-building. Investment in property in Shanxi rose from 66 billion yuan in 2008 to 248 billion in 2013. The area under construction for residential use more than doubled to 179m square metres in the same period. Even by Chinese standards, this was extraordinary. The area under construction in Beijing expanded by only 40%. Such development can keep economic activity going for a while. But a housing boom on this scale is always risky. To judge by the empty space, Shanxi has built far too much.

The government's hope that inland provinces will become new engines of growth rests on a belief that cheap labour and land are vital ingredients of it. But Shanxi shows that these advantages do not necessarily help as much as having a diversified, service-oriented economy. The problem is not that the province has failed to attract new businesses. It has two smartphone factories owned by Foxconn, a Taiwanese consumer-electronics company,

which are its main source of foreign-currency earnings. But the losses of the coal sector offset gains made elsewhere.

Shanxi is unusual among China's provinces in being so dependent on coal. But some of its problems beset the whole country: corruption, unproductive investment and over-mighty SOEs. The country's inadequate provision of pensions and unemployment benefits results in workers

preferring to stay with SOEs which promise to look after them rather than strike out on their own. Leaders in Beijing sometimes make it sound as if the economy's transition from manufacturing-led to services-led growth is going smoothly. In Shanxi the path is very bumpy. As at the Jinhuagong mine-cum-theme-park, it takes even longer to trudge back up to the surface than it does to walk down. ■

Children's literature

Much red reading books

BEIJING

The politics of children's stories

IN CHINA in Mao Zedong's day, frivolous childhood pursuits such as reading were frowned on. The few children's books that were tolerated told stories of revolution and class struggle. These days, toddlers are allowed to have more fun. But though the message has changed, parents and the state still believe the primary role of such works is to shape young minds, not amuse them.

Sales of children's literature have risen by double digits in most of the past ten years, much faster than the growth of book sales overall. The number of children's titles has more than tripled since 2005. This partly reflects a growing demand for products aimed at indulged only-children. A cost-conscious reluctance to have more offspring, which was reinforced by the country's recently relaxed one-child policy, helped fuel that demand. The richer parents are, the more they splash out on children's books.

Booksellers see a huge moneymaking opportunity. Most publishers of literature for adults now offer children's titles too. Around half of the 100 best-selling books

last year were for youngsters—a higher share than in Britain or America. There is a growing variety of genres. Picture books for under-fives have been taking off; fiction for older teenagers is thriving.

Unsurprisingly, given the huge emphasis in China that is placed on passing exams, many titles aim purely to teach facts. Parents like to buy non-fiction, even for children still learning to read. Some books—printed on paperboard and intended mainly for under-twenties—aim to teach the Roman alphabet to infants. Volumes for toddlers with titles such as "How to be a Meteorologist" and "Superstars of Science" do well.

The moral is often laid on thick. One provincial publisher (state-owned, like all of them) has titled a six-volume set of nursery rhymes "A Good Father is Better Than a Good Teacher". Chinese-language versions of foreign classics often proclaim their didactic worth: Paddington, a marmalade-loving bear from darkest Peru, is a model of "thoughtfulness, modesty and self-discipline", proclaims the blurb on the cover of a translation of Michael Bond's popular stories.

China's publishers remain profoundly conservative. They shun books with naughty or frivolous children, or where youngsters outsmart their elders. Cute animals vastly outnumber rebellious figures such as pirates. Few books depict siblings, aunts, uncles or cousins—relationships little understood by the young, thanks to the one-child policy.

Though far less visible than it was in Mao's day, politics still lurks. Publishers have internally appointed censors whose job is to ensure that the Communist Party's line is not transgressed. One executive says she avoids publishing history books for children where "the story does not match the narrative" approved by the party. Maps showing the island of Taiwan as a separate country are omitted from translations. Even a toddler's bedtime story is part of a bigger political picture.



Once upon a time there was a loyal citizen

Banyan | In Hu's name?

Old-time Pekingology makes a comeback; old-time party rule never went away



THE last time people turned out in large numbers in Beijing to commemorate Hu Yaobang, leader of the Chinese Communist Party from 1981-87, it did not end well. In April 1989 he had died of a heart attack. On the eve of his funeral, 1m people took part in the biggest anti-government demonstration yet seen in the People's Republic. Sacked two years earlier for being soft on what was known as "bourgeois liberalisation"—the embrace of Western-style freedoms—Hu was a plausible symbol for pro-democracy protesters, who then staged a weeks-long sit-in in Tiananmen Square in the heart of the capital. They brought party rule to the brink of collapse. It took the massacre of hundreds on June 3rd-4th to bring an end to their movement.

So it seems odd that the party should have made so much of the centenary on November 20th of Hu's birth. Xi Jinping, the present party leader, and his six fellow members of the Politburo's ruling Standing Committee attended a commemoration in the Great Hall of the People, on Tiananmen. Mr Xi's speech extolled Hu as "a time-tested loyal communist fighter and a great proletarian revolutionist"; newspapers were filled with laudatory biographies; a new book of his utterances appeared.

The respect paid to a man who symbolises a liberal strain the party has spurned, and who will forever be associated with its near-death experience in 1989, has prompted speculation about the leadership's intentions. Is Mr Xi, having spent three years in power cracking down on dissent, about to emerge as Hu's political heir, a closet liberal? Might it even presage a "reversal of verdicts" over the Tiananmen protests, no longer to be seen as the work of traitors but of misguided idealists? Both of these explanations seem unlikely. The boosting of Hu may reflect a factional struggle among party leaders, played out, as at times in the past, over the corpse of a fallen comrade. Other interpretations are more mundane. They cast light on how Chinese politics has changed since 1989 and, more strikingly, on how it has not.

One point of continuity is that Hu remains popular. This is in part because of his image—as an earthy, unpompous, tolerant figure whose small stature prompted jokes that he was the only Chinese leader who literally looked up to the diminutive Deng Xiaoping. And bourgeois liberalisation, or some of its facets, remains attractive to many, especially during a period in Mr Xi's China in

which the slow, incremental broadening of personal freedom seems to be in reverse. Moreover, Hu was China's leader, alongside Deng, when China began righting some of the wrongs done during Mao Zedong's tyrannical rule. Many of the countless people who had been persecuted under Mao, and were then allowed to pick up the threads of their lives again, were (and remain) grateful to Hu personally. They included Xi Jinping's late father, Xi Zhongxun. Like Hu and Deng, the elder Xi was a party leader of the old, Long March generation, whom Mao turned against. His rehabilitation is said to have owed much to Hu's intervention. Now, as in 1989, the highest level of Chinese politics is dominated by a relatively small number of families whose mutual debts and grudges span the generations.

Also unchanged is the party's Orwellian effort to control the past. The encomiums to Hu omit his role as an (unwitting) emblem of political reform. And eagle-eyed viewers spotted that, in a television documentary about him, editors had even tampered with a picture of a three-decade-old copy of the party mouthpiece, *People's Daily*, used to illustrate Hu's appointment as party chief. They substituted a photograph of an acceptable party bigwig for that of Zhao Ziyang, who later succeeded Hu but was cast into outer darkness for siding with the Tiananmen protesters. The party has long tinkered with the past like this, though it used to be more honest about it. After Mao died in 1976, the embarrassing prominence at his funeral of his widow and three other close associates who were later arrested and vilified was solved by simply airbrushing them out of the photographs (and replacing their names in the captions with xx, xxx, etc).

That Zhao's image remains taboo gives little hope of a reassessment of Tiananmen. Nor has Mr Xi given many other signs that his hardline exterior cloaks an inner liberal struggling to see the daylight. More probably, he hopes to bask in Hu's reformist glow while reinterpreting "reform" to mean his own policies, and quietly cheering that he faces no living standard-bearer for liberalism. Minxin Pei, of Claremont McKenna College in California, argues that to ignore Hu's centenary would have been more startling than marking it. Despite losing his job, Hu remained to his death on the Standing Committee. Under Mr Xi's predecessor, Hu Jintao (no relation), the party also marked Hu's 90th birthday in 2005. It takes anniversaries seriously. Two years ago, the centenary of one late leader's birth generated a television series and even postage stamps. That was Xi Zhongxun. For Mr Xi to ignore his father's saviour would have looked worse than churlish.

Not to praise Hu, but to bury him

In this context, the publicity given to the event appears to demonstrate Mr Xi's self-confidence. Under him the party is still not ready to confront its Tiananmen demons, but it does not have to worry about invoking the memory of the man in whose name protesters first took to the streets. Mr Xi can present himself as one of Hu's ideological successors and nobody dares gainsay him.

Another analysis, however, would be that Mr Xi, for the reasons just outlined, had no choice but to lavish praise on Hu, and that the celebrations were engineered by those in the party unhappy with his centralisation of power and his illiberalism. They served as a reminder that the party's ideology is not monolithic but, in an old-fashioned phrase, the result of a two-line struggle. That is another way in which Chinese elite politics has not changed: it is a black box, and however rational the analysis, the opposite may also be true. ■

The
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SPECIAL REPORT
CLIMATE CHANGE
NOVEMBER 28th 2015



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Hot and bothered

Not much has come of efforts to prevent climate change so far. Mankind will have to get better at tackling it—but must also learn to live with it, says Joel Budd

LOOKING BACK FROM the early 24th century, Charlotte Shortback suggests, half-jokingly, that modern human history can be split into distinct periods. The most exciting was the Accelerando, from about 2160 to 2200, when human lifespans were greatly extended and the terraforming of Mars was completed. That was followed by the Ritard, when the people of Mars lapsed into isolationism. Long before, though, came a strange spell, from 2005 to 2060, when people understood the science of climate change but did little to prevent it; nor did they try to colonise other planets. She dubs it the Dithering.

Charlotte Shortback is a character in “*2312*”, a science-fiction novel by Kim Stanley Robinson—one of an oddly small band of authors who have written imaginatively and precisely about climate change. In his fictional future, global warming has turned the Earth into a wet, jungle-like planet. New York City is 11 metres under water. In other places, desperate efforts are under way to hold glaciers in place with liquid nitrogen and dams. Will the world really turn out this way? Almost certainly not: strict accuracy is neither the strength nor the purpose of science fiction. But Mr Robinson is right about the present.

What is happening today might not seem like dithering. In a few days world leaders will gather in Paris for a grand conference on climate change, the 21st such get-together since the United Nations

began to grapple with the issue. A torrent of pronouncements and promises has already issued forth—from Pope Francis, Xi Jinping, Barack Obama and many others. The IMF warns that human fortunes will “evaporate like water under a relentless sun” if climate change is not checked soon.

Especially in western Europe, but increasingly in America and China too, wind turbines and fields full of solar photovoltaic panels are becoming familiar features of the landscape. If you buy a car or a house in Europe, or even book a hotel room, you may well be told about its cost in carbon. Many companies, including The Economist Group, monitor their carbon-dioxide emissions and often set targets to reduce them. There is gleeful talk of coal, oil and gas falling from favour so quickly that energy firms will be left sitting on heaps of stranded assets.

None of this, however, amounts to much. At the time of the first UN climate-change conference in 1995, the atmospheric concentration of carbon dioxide was 361 parts per million. Last year it reached 399 parts per million. Between 2000 and 2010 the rise in greenhouse-gas emissions was even faster than in the 1980s or 1990s. The hottest year since records began was 2014; average surface air temperatures so far this decade are ➤

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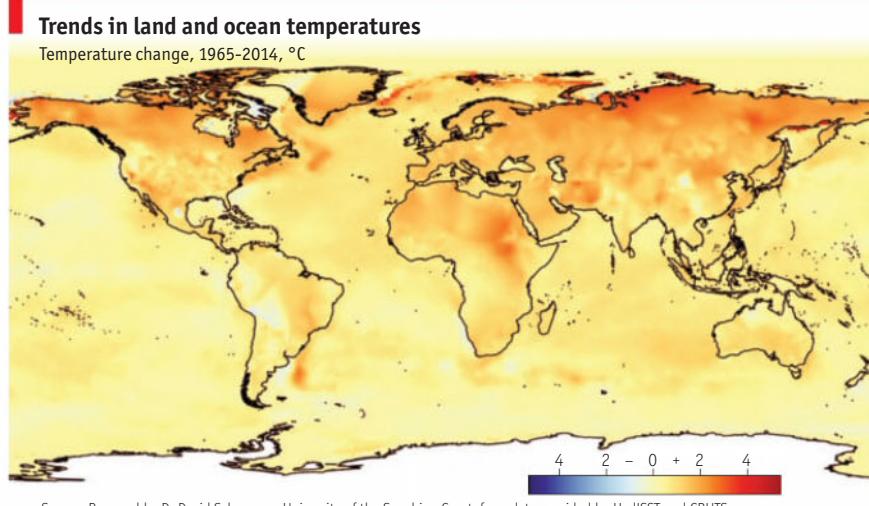
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A list of sources is at
Economist.com/specialreports
An audio interview with
the author is at
Economist.com/audiovideo/specialreports



► about 0.9°C higher than they were in the 1880s. Dieter Helm, an energy expert at Oxford University, points to “a quarter of a century of nothing of substance being achieved”.

The International Energy Agency, a think-tank, estimates that 13.5% of the world’s primary energy supply was produced from renewable sources in 2013. That sounds like a decent slice, but almost three-quarters of this renewable energy came from what are euphemistically known as “biofuels”. This mostly means burning wood, dung and charcoal in poor countries. Hydro-electric power, which has fallen from favour in the West because of its often ruinous effect on river ecosystems, was the world’s second most important source of renewable energy. Nuclear power, which is green but not renewable, supplied 5% of energy needs, and falling. Wind turbines, solar farms, tidal barriers, geothermal power stations and the like produced just 1.3% between them.

The global effort to tackle climate change by imposing caps on countries’ greenhouse-gas emissions, which until recently was described as essential for saving the planet, is over. The UN’s boldest attempt to bind countries, the Kyoto protocol of 1997, expired in 2012. It had achieved little and become unworkable; its passing was not much lamented. No ambitious global deal will be signed in Paris, although whatever document emerges from the conference will no doubt be hailed as significant progress.

Rather than submitting themselves to caps, most countries now say they intend to reduce, or at least restrain, their own emissions. This fragmented, voluntary approach avoids the debate that had paralysed climate talks for years, about whether the burden of cutting greenhouse gases should be carried just by the rich world or spread more widely (a debate rendered absurd by the rise of China). It has the advantage of inclusiveness. Outside the oil-rich Middle East, which is mostly ignoring the process, countries are at least thinking about what they could do.

The promises they will bring to Paris, known as “intended nationally determined contributions”, are diverse and hard to compare. Still, some are plainly more ambitious than others. America pledges that by 2025 it will cut its greenhouse-gas emissions by 26–28% below 2005 levels. South Korea says that by 2030 its emissions will be 37% below where they would be if the recent upward trend in emissions were projected forward. But even if it manages this, South Korea will be emitting 81% more greenhouse gases in 2030 than it did in 1990.

On one matter the conference delegates have already

agreed: global temperatures must not be allowed to rise by more than 2°C (3.6°F) above pre-industrial levels. Politicians and green groups have argued for years that anything more would be wildly dangerous. Almost every book and report about climate change treats this limit as inviolable.

A question of degree

Barring a global catastrophe or the spectacular failure of almost every climate model yet devised, though, emissions of greenhouse gases will warm the world by more than 2°C. “It’s nice for people to talk about two degrees,” says Bill Gates, a philanthropist and investor. “But we don’t even have the commitments that are going to keep us below four degrees of warming.”

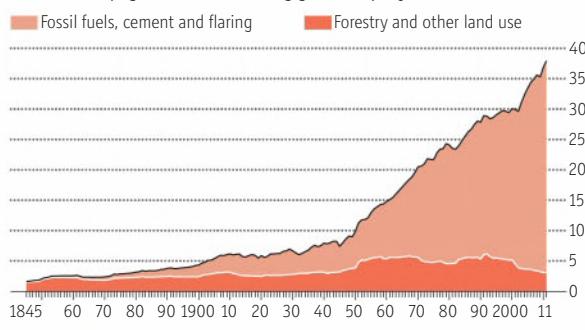
Changes in the atmospheric level of carbon dioxide, the biggest contributor to global warming, persist for centuries. So it is useful to imagine that mankind has a fixed carbon budget to burn through. Pierre Friedlingstein, a climatologist at Exeter University, calculates that if temperature rises are to be kept below 2°C, the world can probably emit about 3,200 gigatonnes of carbon dioxide in total. The tally so far is 2,000 gigatonnes. If annual emissions remain at present levels, the budget will be exhausted in just 30 years’ time.

Global greenhouse-gas emissions might indeed hold steady for a while. Total man-made emissions in 2014 were about the same as in 2013, according to the International Energy Agency. This year’s figure could even be slightly lower than last year’s. As this special report will show, the pause has little to do with the forests of wind turbines and solar panels that have popped up in Western countries, and much to do with developments in China. Still, given the steep rise in greenhouse-gas emissions in recent years (see chart below), it is welcome.

The bad news is that even if greenhouse-gas emissions are stabilising, they are doing so at an exalted level, and there is little reason to suppose that the plateau will be followed by a downward slope. China might burn a little less coal in the next few years, but India will burn more—and the Chinese will drive more cars. “A lot of poor countries are going to get a lot richer by burning fossil fuels,” predicts Bjorn Lomborg of the Copenhagen Consensus Centre, a think-tank. Rich countries will continue to become cleaner, but not dramatically so, at least when the carbon ►

Undeniable

Global anthropogenic CO₂ emissions, gigatonnes per year



► content of the goods they import is added to the reckoning.

Climate change will not be bad for everything and everyone. Some cold countries will find that their fields can grow more crops; others will see fish migrate into their waters. With its ocean-moderated climate, Britain stands out as exceptionally favoured. Yet bad effects will increasingly outnumber benign ones almost everywhere. Some organisms will run into trouble well before the 2°C limit is breached.

This special report will argue that climate change will have to be tackled more intelligently and more economically than it has been so far. Renewable energy is crucial. Contrary to what many claim, though, it is not true that existing solar and wind technologies could cheaply save the planet while also creating lots of green jobs if only they were subsidised for just a few more years. Those renewable power sources have cost consumers dear and mangled energy markets. Paying for yet more wind turbines and solar panels is less wise than paying for research into the technologies that will replace them.

Mankind will also have to think much more boldly about how to live under skies containing high concentrations of greenhouse gases. It will have to adapt, in part by growing crops that can tolerate heat and extreme weather, in part by abandoning the worst-affected places. Animals and plants will need help, including transporting them across national and even continental boundaries. More research is required on deliberately engineering the Earth's atmosphere in order to cool the planet.

It is often said that climate change is an urgent problem. If that were true, it might be easier to tackle. In fact it is a colossal but slow-moving problem, spanning generations. As the next article will show, it is also rather wonderfully mysterious. ■

The science of climate change

Supermodels

What is known about global warming—and what remains dark

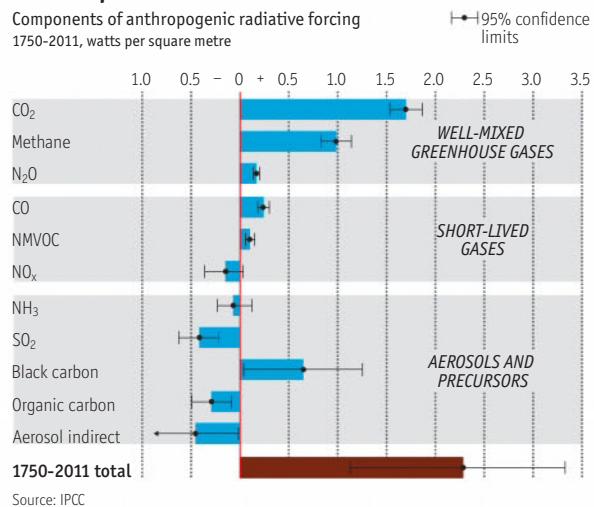
IN AN APPROPRIATELY sweltering lecture theatre at the University of Pierre and Marie Curie in Paris, scientists gathered earlier this year to discuss a phenomenon called the global-warming hiatus. Between 1998 and 2012 humans pumped unprecedented quantities of greenhouse gases into the atmosphere, but the average global temperature barely rose. Why?

Because much energy went into melting ice, explained one. Because it was absorbed by the oceans, said another. Because many small volcanic eruptions threw particles into the atmosphere, deflecting solar radiation, explained a third. Nonsense, said a fourth. There was no hiatus at all—1998 was a freakishly hot year, so it was hardly surprising that temperatures bumped around the same level for a few years. At the end, the moderator summed up: "Well, that's science!"

This sort of thing drives green-minded politicians mad. It is hard enough to persuade voters that global warming is a serious danger that they must pay to avoid, in the form of higher energy bills and unsightly wind farms. If the scientists seem unsure, the task becomes impossible. Despite appearances, though, key parts of climate science are settled. Although the remaining uncertainties are a little larger than green groups generally admit, they are not nearly as big as global-warming sceptics suppose.

The greenhouse effect itself is straightforward; it just does

It adds up



not work much like a greenhouse. About one-third of the energy that pours into the Earth from the sun reflects off clouds and the planet's surface and heads back into space. Much of the rest is absorbed by the land and the oceans, which then emit it largely in the form of infra-red radiation. This is absorbed by trace gases in the atmosphere, which in turn release infra-red upwards, sideways and downwards to the Earth's surface. It is this bouncing around of energy that is known as the greenhouse effect. It is essential to life on Earth; without it, the average temperature at the Equator would be -10°C.

The most important greenhouse gas is water vapour. Were there no water vapour or clouds, the greenhouse effect would be only about one-third as powerful as it is. Carbon dioxide is the second most important, followed by methane, then chlorofluorocarbons (CFCs), industrial chemicals that were cracked down on in the 1980s and 1990s because of their ozone-depleting properties but are still hanging around. These gases are more or less potent and durable. Tonne for tonne, methane is a much more powerful greenhouse gas than carbon dioxide, but it breaks down more quickly. Carbon dioxide, which reaches its maximum warming effect about ten years after being released, is so stable that even 1,000 years after a bump in emissions, atmospheric levels will still be substantially higher than normal.

The basic science is hardly novel. In the 1890s a Swedish scientist, Svante Arrhenius, ran some "tedious calculations" on the greenhouse effect and went on to explain how burning fossil fuels might intensify it (living in a cold country, he thought this a thoroughly good thing). Things get complicated when scientists try to work out what happens to the extra energy that remains in the Earth system and how other human activities, beyond emitting greenhouse gases, might also affect the climate.

Beware the feedback loops

Greenhouse warming sets off a cascade of effects known as feedbacks, which are harder to measure. On balance, warming begets more warming. Higher temperatures enable the atmosphere to hold more water vapour. Oceans absorb huge amounts of carbon dioxide, keeping a lid on climate change—but as they warm up, their absorption capacity declines. Melting ice produces dark pools of water that absorb more energy. Partly for this reason, the Arctic is warming faster than other places.

Inadvertently, though, humans also cool the Earth. Al-

► though the overall effect of deforestation is to warm the planet, replacing trees with crops or grassland makes the land paler and more reflective. Particles created from sulphur dioxide—the cause of acid rain—reflect lots of light back into space. China has probably been shielded from higher temperatures by air pollution, and might heat up quickly if it gets serious about scrubbing its skies.

The greatest mystery is the effect of human activity on clouds. Because clouds grow on aerosol particles, more of them are likely to form in a more polluted atmosphere. Clouds are also affected by temperature changes. But precisely how is unclear—and this matters, because whereas high clouds tend to keep the Earth warm, low clouds tend to cool it. Part of the problem in measuring their effect is that many clouds are small. Climate models tend to simplify the world by dividing the atmosphere and the oceans into boxes, perhaps 50km by 50km in the hori-

zontal plane, and treating these as pixels in a giant three-dimensional computer simulation. To capture cloud processes properly might require climate models with cells just tens of metres square. No computer in the world could handle that.

Add up all these difficulties, throw in some problems with measuring temperatures, and you get a lot of uncertainty. The chart on the previous page, which shows the estimates by the International Panel on Climate Change (IPCC) of “radiative forcing”—perturbations to the Earth’s energy system from human and other activities—contains black bars showing 95% confidence ranges. Some of those bars are long. It is especially hard to be sure of the effect of aerosols.

If the past is a little hazy, the future is more so. Not only does it depend on the outcome of physical processes that are inadequately understood. It also depends on human actions. How many people will be living in 2100? How rich will they be? Will they make strenuous efforts to cut greenhouse-gas emissions, do nothing, or something in between?

If mankind makes heroic efforts, the Earth system will remain within familiar bounds, making predictions easier. If concentrations of greenhouse gases increase steeply, though, things become highly unpredictable. Passing irreversible tipping points, such as the collapse of the Greenland ice sheet, becomes more likely. If nothing were done to avert climate change by 2100, the IPCC estimates, the world would probably warm by between 3°C and 10°C. That enormous range is manageable at one end, unimaginable at the other.

Much remains unknown, then. But, equally, much has been settled—it is just that the settled stuff generates fewer papers and conference panels, because researchers have moved on. Some possibilities that seemed troubling a few years ago have been probed and revealed to be less so. It now appears unlikely, for example, that climate change will lead to the irreversible collapse of the Gulf Stream. Melting permafrost will emit methane, but not as much as some once feared.

Even those mysterious clouds are giving up some of their secrets. Satellite-based radar and laser measurements have enabled scientists to peer into clouds; small-scale models designed to capture their behaviour have been refined and plugged into global models. It seems increasingly likely that low cloud cover will diminish as the Earth warms, speeding the process.

Most important, the basic proposition of climate change—the causal relationship between greenhouse-gas emissions and higher temperatures—has become almost unassailable. As it happens, the interesting debate about the global-warming hiatus has a boring coda: 2013 turned out slightly hotter than 1998, and 2014 was roasting, setting a new record. That will not stand for long. ■

Groupthink

People's views on climate change go hand in hand with their politics

FOR ALL THE torrent of scientific reports, books and television documentaries on the subject, climate change commands a good deal less public attention than Kim Kardashian, a reality-TV star. Early in 2007 Google searches for Ms Kardashian’s name overtook searches for “climate change”. She has never fallen behind since. Even Bangladeshis Google her more than they do the forces that threaten their country—in English, at least.

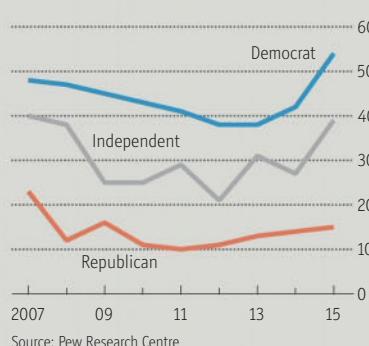
The rich are more concerned about climate change than the poor, who have many other things to worry about. A giant opinion-gathering exercise carried out by the United Nations finds that people in highly developed countries view climate change as the tenth most important issue out of a list of 16 that includes health care, phone and internet access, jobs, political freedom and reliable energy. In poor countries—and indeed in the world as a whole—climate change comes 16th out of 16.

Even in the rich world, interest flagged for a few years following the financial crisis of 2007. It is now recovering a little. But in America, another psephological trend is plain: attitudes to climate change have become sharply polarised along political lines (see chart).

“The partisan divide started in 1997,” says Jon Kroenick of Stanford University. That was when a Democratic president, Bill Clinton, threw his weight behind the UN effort to introduce mandatory caps for greenhouse-gas emissions. It has since widened. YouGov, a pollster, found in 2013 that 70% of Democratic voters saw evidence of man-made climate change in recent weather patterns, whereas only 19% of

A political question

United States, % saying dealing with global warming is a top priority



Republican voters did. A similar, though smaller, divide was found in Britain.

It is not that conservatives are ignorant. Knowledge of science makes little difference to people’s beliefs about climate change, except that it makes them more certain about what they believe. Republicans with a good knowledge of science are more sceptical about global warming than less knowledgeable Republicans.

The best explanation for the gap is that people’s beliefs about climate change have become determined by feelings of identification with cultural and political groups. When people are asked for their views on climate change, says Dan Kahan of Yale University, they translate this into a broader question: whose side are you on? The issue has become associated with left-wing urbanites, causing conservatives to dig in against it. The divide will probably outlive Ms Kardashian’s fame.



Energy

When the wind blows

Renewable power is good. More renewable power is not always better

ON A BREEZY, sunny day in north-east Germany it seems as though the world is running on renewable energy. Near Altentreptow 50-odd giant wind turbines, the tallest 200 metres high, spin above a potato field, making a gentle swishing sound. The hum from the base of each turbine is the sound of electricity being generated, much of it bound for Berlin. The view from the wind farm, across flat fields, is of another wind farm.

Sadly, this is not how the world's power is generated. In truth, the view from Altentreptow does not even properly reflect how Germany's power is generated. The battle to drive carbon dioxide out of the world energy system, which accounts for about two-thirds of human greenhouse-gas emissions, has seen some heartening and visible advances. But clean energy is still being soundly thrashed by the dirty sort.

Even as the wind turbines and solar panels began to spread across the fields of Europe, an ancient black fuel was making a comeback (see chart). In 2000 the world's coal-fired power stations were capable of producing 1,132 gigawatts of electricity between them, according to Enerdata, a Paris-based research firm. By 2014 so many new power stations had been built that they could put out 1,980 gigawatts. Coal, which is about twice as polluting as natural gas, now supplies 41% of the world's electricity and 30% of its overall energy needs.

The biggest single cause of the fossil-fuel boom is China, which is examined in the next article. But rich Western countries are more culpable than they think. They have transformed their rural landscapes with wind farms and pushed up electricity prices for consumers, yet have managed to drive surprisingly little carbon out of the energy system. The record would look even worse if Western countries had not simultaneously exported much of their heavy industry, and thus much of their pollution, to China and other emerging countries.

The large wind farm near Altentreptow is one of hundreds in Germany. Helped by some big storms, these turbines produced 41,000 gigawatt-hours of electricity in the first half of this

year, 15% of Germany's total electricity output. Add hydro-electric power stations, solar farms and biomass, and the country derived 35% of its electricity from renewable sources. Germany has become a world leader in green power, but also a warning about what can go wrong.

Wind and sunshine have two big drawbacks as sources of power. First, they are erratic. The sun shines weakly in winter when it shines at all, and the wind can drop. On January 20th this year the output from all of Germany's solar and wind farms peaked at just over 2.5 gigawatts—a small proportion of the 77 gigawatts Germany produced that day. A few months later, during a sunny, windy spell in early June, the combined wind and solar output jumped to 42 gigawatts.

The second problem with wind and solar energy, oddly, is that it is free. Wind turbines and solar panels are not free, of course. Although the cost of solar photovoltaic panels has plunged in the past few years, largely because Germany bought so many, wind and solar farms still tend to produce more expensive electricity than coal or gas power stations on a "levelised cost" basis, which includes the expense of building them. But once a wind or solar farm is up, the marginal cost of its power output is close to zero.

The problem lies with the effect of renewables on energy markets. Because their power is free at the margin, green-power producers offer it for next to nothing in wholesale markets (they will go on to make money from subsidies, known as feed-in tariffs). Nuclear power stations also enter low bids. The next-lowest bids tend to come from power stations burning lignite coal—a cheap but especially dirty fuel. They are followed by the power stations burning hard coal, then the gas-fired power stations. The energy companies start by accepting the lowest bids. When they have filled the day's requirements, they pay all successful bidders the highest price required to clear the market.

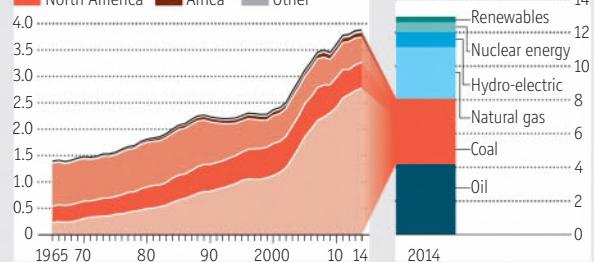
The surge of solar and wind power is pushing down the clearing price and bending Germany's energy market out of shape. Power stations burning natural gas increasingly find no takers for their electricity, so they sit idle. Meanwhile the cheap, carboniferous lignite power stations burn on (see chart, next page). Coal-fired power capacity has actually increased in the past few years. Coal is likely to become even more important to ►

Where coal is king

Consumption, tonnes of oil equivalent, trn

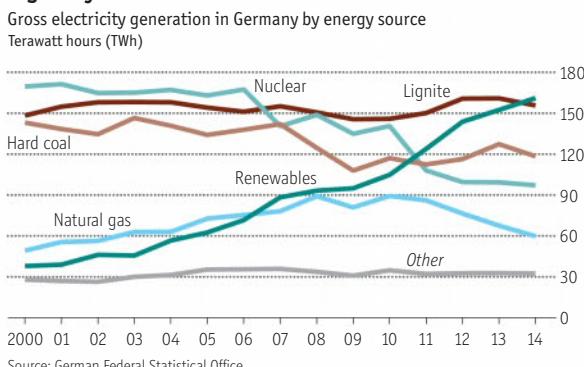
Coal, by region

Asia Pacific	Europe & Eurasia
North America	Africa
	Other



Source: BP Statistical Review of World Energy 2015

A grubby mix



Source: German Federal Statistical Office

The government ought to compensate them for that, they say, otherwise they might have to close down.

Terrified of looming blackouts, Western governments are increasingly paying fossil-fuel power stations to stay open. Some offer “capacity payments”—money for standing by. Texas tries to keep the power stations open by promising higher prices at times of strong demand. These payments are a hidden cost of using more wind and solar energy.

Moreover, in many countries, including America, renewable-power producers rely on coal- and gas-fired power stations to set the market price of electricity at a healthy level, points out Frank O’Sullivan, an energy researcher at the Massachusetts Institute of Technology. Solar farms that offer their power for next to nothing will eventually depress the market so much that they render themselves uneconomic without heavy subsidies.

There are ways out of this mess. If governments were to levy a hefty tax on carbon, they would drive the most polluting power stations off the system. Germany does not do this: it relies on the European Emissions Trading System, which sets a rock-bottom carbon price. But Sweden does, and Britain has a floor price, which amounts to the same thing. Better still, says Mr Helm at Oxford University, a heavy carbon tax could be combined with market reforms that would force renewable power producers to bear the costs of their intermittency.

It would help if electricity grids were bigger and more efficient. The larger the grid, and the less power lost per kilometre of transmission, the less intermittency matters: cloudy and windless conditions rarely prevail across an entire continent. Denmark gets away with relying heavily on wind turbines because it has a connection to Norway, which can supply hydro-electric power on demand. But Germany’s efforts to build long-distance transmission lines have been stymied by not-in-my-backyard protests.

Better energy storage would help, too. Hydro-electric power stations have been used to store energy for decades. But there is not always an uphill reservoir handy, and other ways of storing energy, such as lithium-ion batteries, are expensive. More promising, probably, is automatic demand reduction. Smart meters can turn down household freezers and air-conditioning units briefly when power is in short supply and then power them up again, thereby shifting demand. Sia Partners, a consultancy, estimates that European countries could cut peak demand by 9% with such methods.

But they can do only so much. Energy storage and demand-response technologies are good for matching supply with demand during the course of a single day. In a place like California, power demand is highest on sunny summer afternoons, when people turn up their air-conditioners. Solar farms produce most of their power around the same time, so with a bit of clever demand adjustment the peaks of supply and demand could be aligned. In northern Europe, however, electricity demand is highest in the early evening in winter, when solar farms are producing no power.

Near Altentreptow, electricity from the wind farm is being used to turn water into hydrogen and oxygen. The hydrogen is stored in tanks and burned to produce power when the wind drops. The firm doing this, WIND-Projekt, just wants to be able to keep the lights on. The process is inefficient: 84% of the original electricity gets lost in being converted and reconverted. But perhaps the hydrogen could be sold directly to consumers, or the heat could be captured. At any rate, suggests Marcus Heinicke of WIND-Projekt, the days of being able to sell power only when the wind blows will not last for ever. ■

► Germany’s energy supply in future because the government is committed to phasing out nuclear power by 2022.

One of Germany’s biggest coal-fired power stations, Jänschwalde, sits near the border with Poland. Built in the 1980s, it burns 80,000 tonnes of lignite a day and can put out three gigawatts of power. Jänschwalde has also become ever more flexible, ramping up and down speedily as the weather changes. Lignite is proving to be an excellent partner for erratic wind and solar power, argues Olaf Adermann of Vattenfall, the firm that owns Jänschwalde. Sadly for the environment, he is right.

Earlier this year a shamefaced German government moved to regulate lignite-burning power stations out of existence, but after thousands of miners protested in Berlin, it dropped that

Terrified of looming blackouts, many Western governments are increasingly paying fossil-fuel power stations to stay open

policy. The country appears to be stuck with coal. It is likely to miss its self-imposed target for reducing greenhouse-gas emissions, reckons McKinsey, a consultancy. And because of generous feed-in tariffs for renewables that are guaranteed for 20 years, consumers in Germany are paying high prices for their not especially clean power. In the first half of this year households there paid €0.30 for a kilowatt-hour of electricity, whereas the French paid a mere €0.16.

Germany has made unusually big mistakes. Handing out enormous long-term subsidies to solar farms was unwise; abolishing nuclear power so quickly is crazy. It has also been unlucky. The price of globally traded hard coal has dropped in the past few years, partly because shale-gas-rich America is exporting so much. But Germany’s biggest error is one commonly committed by countries that are trying to move away from fossil fuels and towards renewables. It is to ignore the fact that wind and solar power impose costs on the entire energy system, which go up more than proportionately as they add more.

Many wealthy countries have too many power stations, the result of a building boom before the financial crisis. This oversupply, combined with the solar- and wind-power boom and the falling wholesale price of electricity, has crushed investment in modern, efficient power stations. It has also turned all energy producers into beggars. Owners of power stations burning coal and gas point out that if they are frequently undercut by wind and solar farms, their costs per watt of electricity produced rise.

China

Seeing daylight

The world's biggest polluter cleans up

WHEN THE NATIONS of the world first tried to cut a deal to reduce greenhouse-gas emissions, in the late 1990s, a gorilla stood in the way. America, then the world's biggest polluter, would not consent to mandatory reductions, all but strangling the accord. These days China is the biggest polluter and the country without which no global agreement will stick. But it is not quite the climate pariah that it is often thought to be, and it has started to change.

China emits more greenhouse gases than anywhere else in the world partly because it has a lot of people: 1.4 billion, compared with 800m for America and the EU put together. And much of the pollution it causes comes from making goods for other countries. The chart on the next page, which uses data from Michael Grubb of University College London, controls for both of these things. It shows that, once the pollution that goes into traded goods is assigned to the country that consumes them, the average Chinese person harms the planet less than does the average European and much less than the average American. He is catching up fast, though.

China was responsible for three-quarters of the net coal-fired power-generating capacity added worldwide between 2000 and 2014. And the country's hunger for the black stuff is not

limited to its power stations. At least a quarter of Chinese coal is used in what Laszlo Varro, a fossil-fuels expert at the International Energy Agency, calls a "Dickensian" manner. Burned, inefficiently, in boilers to heat buildings and power textile mills, it has fouled the air around Chinese cities, turning them into simulacra of 19th-century Manchester.

Climate-change denial is strikingly rare among China's political leaders, some of whom trained as engineers. They understand that their country is expected to suffer some of the worst consequences of global warming: northern China, which is increasingly hot and dry, will probably become hotter and drier still. The politicians are also well aware that their country's urbanites are fed up with breathing toxic air. Earlier this year an online documentary film about air pollution, "Under the Dome", was watched perhaps 300m times before being ordered off the Chinese internet.

Before 2012 no city disclosed air-quality data, recalls Ma Jun of the Institute of Public and Environmental Affairs in Beijing. Now about 400 do. Around the big cities, heavy polluters are increasingly chivvied to clean up. To an extent, the problem is simply being pushed from China's coastal cities towards the interior. But that is progress of a kind. The coal-fired power stations that are shutting on the east coast are some of the most polluting in the world. The new ones being built in the west are some of the world's best. They burn coal at higher temperatures and use higher pressures, making them more efficient.

China is also throwing money at nuclear power and renewables. It spent almost one dollar in every three invested in renewable energy around the world in 2014, according to Bloomberg New Energy Finance, a research firm. Last year China got about 11% of its energy from renewables, helped by an unusual quantity of rainwater to power its hydro-electric stations. The country ➤



A hazy prospect of cleaner air

► also claims to have connected five gigawatts of solar-power capacity to the grid in the first three months of this year—almost the equivalent of all the solar panels in France.

Some of this renewable power is wasted. In China's command-and-control energy market, power stations are contracted to produce electricity months in advance. Although the energy companies are supposed to favour renewables, they find them hard to handle because their supply is not reliable. And many coal-fired power stations supply heat as well as electricity to local customers, making them preferable to solar and wind farms in winter. In short, says Li Shuo of Greenpeace, an environmental group, China is trying to plug 21st-century power sources into a 20th-century power grid. Behind closed doors, though, officials are working to make the energy market a little more welcoming to green power.

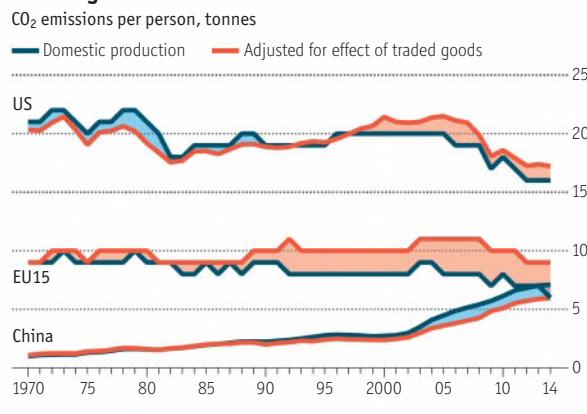
Tower blocks don't grow to the sky

Even more than the clean-air regulations or the renewables, it is China's economic slowdown and the shift from heavy industry and construction to services that has been curbing demand for coal. Mr Varro points out that China can hardly go on consuming energy-intensive goods like steel and cement the way it has done. In 2012 Chinese cement consumption amounted to 1,581 kilograms per person, compared with just 232kg in America. Eventually the roads and tower blocks will have been built and demand will plunge.

Nobody quite knows how much coal is burned in China. Misreporting is common: earlier this year official statistics were amended to suggest that the country had consumed 14% more coal between 2000 and 2013 than had been thought. Yet the quantity might now be falling. Consumption seems to have dropped very slightly between 2013 and 2014. In the first seven months of this year China's mines produced 5% less coal than they did during the same period last year. If this trend were to continue, it would make the government's pledge to reach peak greenhouse-gas emissions by 2030 seem unduly modest.

China will remain a heavy polluter. Though steel and cement factories will probably use less energy in future, ordinary people will doubtless consume more. As they grow richer, they demand air-conditioning, cars and bigger homes: in 2012 the average city-dweller inhabited 33 square metres, compared with 25 square metres a decade earlier. Still, the astonishing surge in dirty, coal-fired energy consumption has probably subsided, thinks Mr Grubb. It might just be a little hard to see, through the hazy, choking air. ■

Learning curves



Adaptation

If you can't stand the heat

How farmers in poor countries are responding to climate change

IN THE BRACKISH coastal districts of southern Bangladesh, weather can be measured in centimetres. Women in Bujbunia, 140km (about 90 miles) south of Dhaka, hold their hands at knee height to show how deeply the village flooded during the most recent big cyclonic storm. Aila swept northward through the Bay of Bengal and hit Bangladesh in May 2009. The country had seen much bigger weather events; in 1991 a huge cyclone killed about 140,000 people. Still, Aila's storm surge brought enough seawater to inundate villages and wipe out rice crops. The inhabitants of Bujbunia still wince when they recall how hungry they were afterwards.

Few countries of any size are more gravely threatened by climate change than Bangladesh (which has more than 110m people). Sarder Shafiqul Alam of the International Centre for Climate Change and Development in Dhaka checks off the many hazards. North-west Bangladesh seems to be turning drier. In the north-east and central parts of the country, flooding is a growing danger. The south and east are vulnerable to cyclones, which will probably intensify as the planet heats up (the higher the temperature, the more energy in the weather system). The south is also becoming saltier, partly because the sea is rising and partly because many farmers are inundating their fields with seawater so they can grow shrimp.

To counter the most spectacular threat to human life, Ban-



► gladesh's government has built several thousand cyclone shelters—at best, sturdy buildings sitting atop pillars of reinforced concrete, which in normal times are often used as schools. One new shelter a few kilometres from Bujbunia could accommodate more than 1,000 people if they were to press closely together, and might even hold a few hundred cows on the ground floor. Women and children will rush there if a big cyclone threatens; men will head for the nearest brick-built mosque.

Farmers are also preparing for storm surges in a humbler way. Scooping up greyish mud, they build plinths up to a metre high. Levelled and packed down, these become the floors of their homes; walls and roofs are made of palm fronds, bamboo and corrugated iron. The aim is to build the plinth higher than the flood waters will reach, to prevent the family's food and possessions being swept away. Even stoves would be destroyed; they are only made of earth.

Whereas the global attempt to avert global warming by cutting emissions is not exactly racing forward, adaptation to climate change is well under way. Between 1993 and 2009 the proportion of American households with air-conditioning rose from 68% to 87%. Californian cities are coping with an epic four-year drought, which may have been exacerbated by climate change, by buying water rights from farmers and recycling more waste water. San Diego is building an expensive desalination plant. In sub-Saharan Africa many farmers are diversifying from growing wheat to sorghum and other crops. Few of the people making such adjustments are thinking explicitly about global warming; they are simply trying to make themselves more comfortable and secure. Yet their actions add up to the most profound and intelligent response to climate change so far.

Bringing down emissions of greenhouse gases asks a good deal of people, not least that they accept the science of climate change. It requires them to make sacrifices today so that future generations will suffer less, and to weigh the needs of people

who are living far away. Adaptation requires none of these things. "Because of the free-rider problem, each of us has very weak incentives to alter our behaviour," says Matthew Kahn, of the University of California, Los Angeles. "But we have very strong incentives to respond to whatever the climate throws at us."

Bewket Amdu, Azemeraw Ayehu and Andent Deressa have surveyed almost 400 villagers in the upper catchment of the Blue Nile in Ethiopia and found that almost everybody believes temperatures are rising. Most villagers also think less rain is falling, although some are convinced the weather has become wetter. They have responded by tweaking their farming techniques. The villagers now plant potatoes two to three weeks later than they used to and harvest them a week earlier. The growing seasons for wheat and barley have also contracted by about a month. Yields are lower, but that is preferable to losing an entire crop to flooding or drought.

To save farmers from having to make such dismal trade-offs, laboratories in Africa and elsewhere are developing crops that can survive more extreme weather. One poetically nicknamed innovation is "scuba rice", which can endure being submerged for up to two weeks. BRAC, a large NGO based in Bangladesh, is training farmers to switch from ordinary rice to salt-tolerant varieties, or to grow sunflowers instead. It has also pioneered a combination of agriculture and aquaculture. During the monsoon season farmers raise freshwater fish in their flooded fields.

As the ground dries out, the fish move to a pool at one end, freeing the remainder of the field for rice-growing.

Adaptations like these are conservative. They enable farmers to keep living in the same place and working the same fields, albeit growing different things. The hope is that higher agricultural productivity will protect people against climate shocks and also keep them from encroaching on forests. The rate of deforestation has slowed around the world in the past few decades, mostly because of better policing in Brazil, but last decade it still accounted for about 12% of global greenhouse-gas emissions.

Yet poor farmers will continue to live dangerous, precarious lives. Homes built of bamboo and corrugated iron in southern Bangladesh will not survive a really big cyclone, no matter how high they are raised off the ground. And cyclones are far from the only hazard in the region. To cook food, the farmers who live in these flimsy homes burn wood and animal dung, and thereby gradually poison themselves. Some of the water wells are contaminated not just with salt but with arsenic.

Urban idyll

To protect themselves against these diverse dangers, the farmers of southern Bangladesh need to make drastic changes. They are doing that by investing in their children's education. In a secondary school in the settlement of Sreefaltola, a class of eighth-graders, mostly farmers' children, shout out their plans for the future. Almost every one of them aspires to be an electrical engineer or a doctor, or at least to find a job in a nearby city. Not all will succeed; many will probably stay in farming. But those who make it might be able to move their parents out of one ►

► of the most hazardous places in Asia.

This is not normally what is meant by adaptation to climate change. All the same, it is the most effective method of adaptation in Bangladesh, says Mr Alam. Some have taken it even further. In the village of Gobindapur, a grand new house is being built, two storeys high and made of solid brick. It belongs to Reshma Begum, an imperious woman in a pink sari. Clutching two mobile phones, she complains that it is becoming increasingly hard to find domestic workers now that so many young women in the village are running small businesses. Some of her income comes from a son who works in Malaysia.

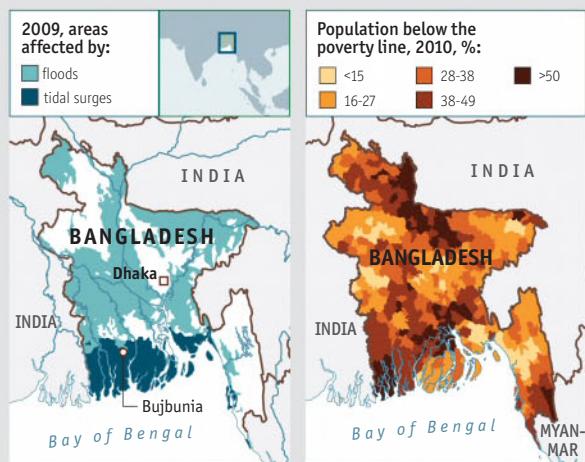
Migrations such as these are beginning to show up in official statistics. Between 2001 and 2011 the population of Barisal division in southern Bangladesh fell slightly, even as numbers in the country as a whole went up. Within the district, people moved from the countryside to cities, so that Barisal's rural population dropped from 1.96m to 1.81m. By removing people from the most flood-prone areas, urbanisation may be doing as much to preserve life as any number of cyclone shelters.

A decade ago adaptation was almost taboo in international discussions about climate change, because it was believed to distract attention from the task of stopping global warming altogether. Now both are recognised as important. Rich countries are trying to rustle up \$100 billion a year by 2020 to help poor countries cope with climate change—a bribe to keep them coming back to the climate talks, to be sure, but also a welcome sign of changing priorities. Even China is chipping in.

It is not yet clear whether the money will be spent on better crops and fertilisers or on solar panels and other green-energy schemes that will help poor countries hold down their greenhouse-gas emissions. Britain, which spends an unusually large share of its budget on foreign aid, suggested in September that its contribution to the Green Climate Fund would be divided evenly between those two things.

That is the wrong balance. Solar panels are nice to have; many Bangladeshi farmers already possess small ones which they use for charging mobile phones and powering a couple of light bulbs. But these are no substitute for reliable electrical power, and there are plenty of more important things. Diverting money that would otherwise be spent on health and sanitation to expensive forms of clean energy will make it harder, not easier, for the world's poorest people to cope with climate change. ■

In the climate crosshairs



Sources: World Bank; Bangladesh Bureau of Statistics; World Food Programme



Biodiversity

A modern ark

To save endangered species, move them to more congenial places

ALONG THE BANKS of the Apalachicola river, near the border between Florida and Georgia, lives a rare tree called a stinking cedar. Once common, *Torreya taxifolia* seems to have got stuck in this tiny pocket as the continent warmed after the last ice age. It cannot migrate northward because the surrounding soils are too poor. Attacked by fungi, just a few hundred stinking cedars remain along the river. Rising temperatures now threaten to kill them off entirely.

Spying a looming extinction, a group of people is engaged in a kind of ecological vigilantism. The self-styled "Torreya Guardians" collect thousands of seeds a year and plant them in likely places across the eastern United States. Stinking cedar turns out to thrive in North Carolina. The Torreya Guardians are now trying to plant it in colder states like Ohio and Michigan as well. By the time the trees are fully grown, they reason, temperatures might be ideal there.

Some are dubious. The Torreya Guardians were at first seen as "eco-terrorists spreading an invasive species", remembers Connie Barlow, the group's chief propagandist. She rejects that charge, pointing out that she is only moving the tree within America. She also thinks that drastic action of this kind will soon be widespread: "We are the radical edge of what is going to become a mainstream action."

Conservation is nearly always backward-looking. It aims to keep plants and animals not just where they are but where they were before humans meddled. The only real debate is over how far to turn back the clock. Scotland and Wales have been heavily grazed for centuries, giving them a bald beauty. Should they now be reforested, or "rewilded", as the trendy term has it? Should wolves be encouraged to reclaim their ancient territory in America's Rocky Mountains?

In a rapidly warming world, this attitude is becoming outdated. No part of the Earth can be returned to a natural state that prevailed before human interference, because humans are so rapidly changing the climate. Conservation, as traditionally practised, is being overtaken by fast-moving reality. In future the question will no longer be how to preserve species in particular places but how to move them around to ensure their survival.

A cool move

Global warming has already set off mass migrations. Having crossed the Baltic Sea, purple emperor butterflies (pictured above) are fluttering northward through Scandinavia in search of cooler temperatures. Trees and animals are climbing mountains. The most spectacular migrations have taken place in the oceans, says Elvira Poloczanska of CSIRO, Australia's national science agency. Many sea creatures can move quickly, which is just as well: in the oceans it is generally necessary to travel farther than on land to find lower temperatures. Phytoplankton populations are moving by up to 400km a decade.

Not all plants and animals can make it to new homes, though. Some will be hemmed in by farmland, cities or coasts. Animals that live in one mountain range might be unable to cross a hot plain to reach higher mountains. And many will find that the species they eat move at a different speed from their

► own: carnivorous mammals can migrate more quickly than rodents, which in turn migrate faster than trees. The creatures that already inhabit the poles and the highest mountains cannot move to cooler climes and might be done for.

It is not clear that climate change has yet driven any species to extinction. Frogs native to Central and South America have been wiped out by a fungus to which they may or may not have become more vulnerable as a result of changing temperatures. Yet the speed at which species' habitats are shifting suggests they are already under great pressure—which will only increase in the next few decades. Chris Thomas, an evolutionary biologist at the University of York in England, has estimated that by 2050 between 18% and 35% of species could be on the path to extinction.

A few years ago Mr Thomas helped transport hundreds of butterflies—marbled whites and small skippers—to Durham, at least 50km north of their usual range, and released them into the cooler air. The butterflies fared well. These days he thinks bigger. Why not move creatures farther, he suggests, to places where they have never lived?

He suggests several candidates for “assisted colonisation” to Britain. The Caucasian wingnut tree, which clings on in a few moist parts of Turkey and Iran, could probably be planted widely. De Prunner's ringlet, an endangered butterfly native to southern Europe, feeds on grasses that are common in Britain. The Iberian lynx, an endangered cat, would find lots of rabbits to eat. Britain is a highly suitable ark for other countries' endangered species: thanks to the Gulf Stream, its climate is expected to remain broadly constant over the next few decades.

The notion of deliberately moving species a long way from home is starting to look a little less heretical. The International Union for Conservation of Nature, which shapes biodiversity policy, recently revised its guidelines, apparently giving a slight nod to such relocations. It insists upon great caution. But “if you have too much risk assessment, nothing will happen, and these species will go extinct,” says Mr Thomas. ■



Any room for a lynx?

Geoengineering

If all else fails

Man-made global cooling is scary, but may become necessary

THE SUM OF human tinkering with the climate since the beginning of the industrial era is sometimes likened to a planetary science experiment. That captures the magnitude of what is happening and the unpredictability of its results, yet it is also misleading. Global warming is not an experiment, because it is not intentional. Greenhouse-gas emissions are the unfortunate side effects of useful things like modern agriculture, electricity generation and convenient transport. Mankind has not really started experimenting with the climate yet.

But perhaps, given the slow progress in keeping down emissions, it should. A small, underfinanced and somewhat obsessive group of scientists is working on ways of “geoengineering” the Earth to reverse global warming. Some of their proposals are absurdly costly; others are exceedingly dangerous. Still, geoengineering deserves much more serious consideration than it has so far received.

Since climate change is mostly caused by greenhouse gases, the obvious way of reversing it is to remove those gases from the atmosphere. Removing carbon dioxide from the air would also help marine creatures: the oceans are becoming less alkaline as a result of dissolved carbon, which seems to be harming corals. Some scientists are exploring ways of speeding up the natural processes that already do this. Carbon-absorbing minerals like olivine, which is in abundant supply, could be mined, crushed and spread out. Lime or limestone could be tipped into the ocean to react with dissolved carbon dioxide to create bicarbonate ions, allowing the water to absorb more carbon dioxide from the air. Iron and other nutrients could be added to the water to stimulate the growth of algae, which feed on carbon dioxide.

Plants could be grown and then burnt in power stations capable of capturing the carbon that the plants had removed from the air; the gas could then be compressed and buried under the ocean. Carbon dioxide could be filtered out of the smoke that rises from factories and power stations, or even just out of the air. A Canadian firm, Carbon Engineering, has just opened a pilot plant that will do this.

All methods of removing carbon dioxide from the atmosphere are even more challenging than they might seem at first sight. That is because the ocean and the land currently absorb about half of human emissions. If atmospheric concentrations were brought down, some carbon dioxide would naturally “out-gas” from the seas and the land, adding to the amount that would have to be removed.

And two fundamental (though contradictory) criticisms are levelled at the carbon-suckers. First, their methods are so costly that they could not possibly be deployed on the scale required to alleviate climate change. And second, if those methods could be made to work, they might introduce moral hazard. If greenhouse gases could magically be removed from the atmosphere tomorrow, why bother with cutting emissions today?

The first objection is a good one. Carbon-removal techniques are indeed extraordinarily costly, and not just in a financial sense. Tim Kruger of the Oxford Martin School estimates that in order to remove just one gigatonne of carbon (roughly one-tenth of current annual emissions) from the atmosphere, 4.5 ➤

► gigatonnes of lime would have to be dumped into the ocean. That would require 6.5 gigatonnes of limestone, or almost one tonne for every man, woman and child on Earth, and 4,500 factories to make it into lime. Alternatively, growing plants and then capturing their carbon would require enormous quantities of agricultural land to make much difference to the climate.

Still, many of these technologies deserve to be tried out. The costs of some carbon-removal methods might come down in time, though others might turn out to be even more expensive than their proponents think. And at some point in the future one of them, or a combination, will have to be deployed if climate change is to be arrested. It will be impossible to prevent all greenhouse-gas emissions. There will always be individual national holdouts, and there will always be niche uses for gas and oil, such as powering passenger aeroplanes.

The second objection to carbon removal, that it encourages recklessness, would be persuasive only if it could be done cheaply. At the moment it looks so costly and so tricky that it cannot be used to justify putting more greenhouse gases into the atmosphere. Indeed, it would be good to have more research into these technologies if only to see just how costly they would be. Most of the theoretical means of avoiding large-scale global warming assume that tens or even hundreds of millions of hectares of land can be given over to growing energy crops. It would be helpful to know how realistic that might be.

At best, carbon-dioxide removal might turn out to be an expensive way of dealing with the chief cause of climate change. But there is another approach, which is to attack climate change directly. This could work out much cheaper. Indeed, it would almost certainly be cheaper than replacing fossil fuels with renewable sources of power. That is only one reason it is so unnerving.

For all that human activities are perturbing the climate, those actions appear trivial when set beside the enormous heat engines that create the Earth's weather. Even doubling the concentration of carbon dioxide in the atmosphere would create a radiative forcing of only four watts per square metre, a number dwarfed by the 240 watts per square metre that pours into the Earth from the sun. That suggests a straightforward and highly appealing calculation. Four divided by 240 is 0.017. To offset the warming effect of a doubling of carbon dioxide, then, it might be necessary to intercept only about 1.7% of the solar radiation that currently reaches the Earth.

Spray and pray

Some early satellite pictures contained what appeared to be scratches, says John Latham, a scientist who lives in Colorado. These turned out to be ship tracks—linear clouds that grow on aerosols emitted by ships as they traverse the seas. What has been done inadvertently could be done better deliberately. If ships were to create tiny salt particles from seawater in just the right places, water droplets would form on them. That would alter a type of cloud called a marine stratocumulus. With more droplets of a smaller size, the cloud would become lighter and



Ship tracks are linear clouds that grow on aerosols emitted by ships. What has been done inadvertently could be done better deliberately

thus more reflective. Seawater is innocuous; “it’s benign and it’s infinite,” explains Mr Latham. And marine stratocumulus clouds are so common that the Earth might be cooled substantially.

The big technical problem so far has been to produce nozzles capable of consistently producing tiny droplets. Many ships would be needed to trundle up and down the best cloud-lightening corridors (the west coast of Africa is especially good). But these difficulties hardly seem insurmountable. A report published in 2012 for the Copenhagen Consensus Centre estimated that marine-cloud brightening would prevent global warming even more effectively than a carbon tax.

If spraying seawater into the air would probably cool the Earth, spraying sulphur into the stratosphere would be almost certain to do so. It has been done, after all. Volcanoes spew out sulphur that creates particles which reflect sunlight back into space; those particles also bounce light around the atmosphere, producing wonderful sunsets. These can cool the Earth significantly, albeit briefly (see chart, next page): within a year or so the particles are washed out of the atmosphere.

Sulphur could be sprayed at precisely the right height and in very fine droplets, which would reflect more light for longer. It might take only a small fleet of high-altitude aircraft flying in relays to put enough in the stratosphere to cancel out the entire temperature rise resulting from human greenhouse-gas emissions. The sulphur would eventually fall as acid rain, but not in alarming quantities: the amount of sulphur required would be much less than is currently thrown up into the air by vehicles and factories.

Both marine-cloud brightening and stratospheric aerosols carry risks. One is that cooling the Earth without removing carbon dioxide does not quite return the climate to normal. The more carbon dioxide that is present in the air, the less plants perspire, affecting the water cycle. And the heat-trapping greenhouse effect would still operate, just with less heat in the system. ►

► With temperatures more evenly distributed in the atmosphere, there would be less convection and, presumably, less precipitation. So a cooler world with lots of greenhouse gases would probably be a drier world. Any country that suffered a drought would surely blame the geoengineers.

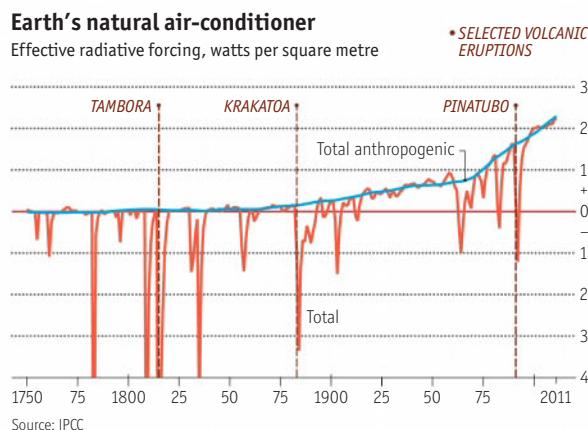
But the biggest problem is what would happen if the engineering stopped. Assuming that greenhouse-gas emissions continued while the ships or aeroplanes were doing their work, abruptly ending the artificial shielding would lead to a sudden jump in temperatures, which would be disastrous for people and the natural world alike. Ken Caldeira of the Carnegie Institution points out that an abrupt “termination shock” could be avoided if geoengineering were used only to slow global warming and then gradually wound down. But that assumes the nations of the world can agree on how to manage the climate. The history of United Nations climate talks suggests they can’t.

Still, these methods ought to be developed and even—very carefully—tested. The Earth might need a drastic intervention, particularly if it became clear that something alarming was about to happen, such as a breakdown of the Indian monsoon. Marine-cloud brightening could be deployed on a small scale to avert specific disasters. Mr Latham suggests that cooling just a few hundred square kilometres of ocean in the right place could make a hurricane less severe. If the climate-modellers are right that hurricanes will become more intense as the ocean warms, this will become increasingly tempting.

Better the devil you know

The most persuasive reason for investigating geoengineering further is that somebody is likely to try it. Countries will have different ideas about when global warming becomes truly dangerous: Britain, for instance, is a lot more sanguine than the Maldives. Some of the more skittish states might start injecting aerosols into the lower stratosphere, perhaps in a clumsy way. If no formal experiments had been carried out and thus scientists in other countries did not know what to look for, it might not be obvious for some time that this was going on.

David Victor, who studies the politics of climate change at the University of California, San Diego, doubts that nations would ever formally agree to engineer the Earth’s climate: their interests are too diverse. He thinks it much more likely that a country would just go ahead and try it. That would put the others in a quandary. Should they forcibly stop that country from acting, or should they step in with superior geoengineering techniques? Before long, Mr Victor says, they could find themselves acting as zookeepers to the planet. ■



The way forward

Second-best solutions

If the best method for tackling climate change is not on offer, try something else

ECONOMISTS LIKE TO argue, about climate change as much as anything else. Some of the fiercest rows are over the discount rate—how to weigh the likelihood that future generations will be richer than the current one when deciding how much to spend on averting climate change today—and over how to price catastrophic but unlikely events such as the collapse of the Greenland ice sheet. But on the biggest issue of all they nod in agreement, whatever their political persuasion. The best way to tackle climate change, they insist, is through a global carbon tax.

Politicians tend to assume that subsidising clean energy has the same effect as taxing carbon, says Ottmar Edenhofer, an economist at the Potsdam Institute for Climate Impact Research. It does not. Subsidies for wind, solar and nuclear power increase the supply of wind, solar and nuclear energy, but they do not squeeze the polluters. Indeed, as has been shown earlier in this report, green-power subsidies can actually boost the most polluting fossil fuels. A carbon tax would bear down on the thing that most needs to be suppressed.

Carbon taxes have their problems, though, beginning with the word “tax”. New levies are never popular. Even if governments promised to cut other taxes, so that a carbon tax would be fiscally neutral, they would make enemies. It is a sound rule of politics that the winners from any reform are less delighted than the losers are angry. And no government could guarantee that carbon-dioxide emissions would fall by a specific amount. A carbon tax represents certain pain for uncertain gain.

Instead, many countries have adopted “cap-and-trade” schemes. These specify the quantity of carbon that can be emitted and hand out, or auction, permits to pollute up to that limit. Polluters can buy and sell permits, which in theory means that the cheapest methods of reducing emissions are deployed first. By far the biggest cap-and-trade scheme was launched in 2005 by the European Union. It covers not only carbon dioxide but also nitrous oxide and perfluorocarbons, and includes emissions from commercial aircraft. California also has a cap-and-trade scheme, which is linked to projects run by some Canadian provinces. Earlier this year South Korea set one up. China, which already has six regional schemes of this sort, has promised a national one.

Capping and trading pollution is less good than taxing it. Under pressure from heavy industry, governments tend to hand out too many pollution credits, so the price is invariably too low to alter behaviour. As this report went to press, carbon was trading in Europe for less than €10 a tonne. And cap-and-trade schemes can encourage free-riding. If a country covered by an international emissions-trading scheme decides to enforce stricter regulations, the market will be flooded with cheap pollution credits, encouraging others to pollute more. It helps to set a minimum carbon price and keep raising it, as California is doing.

The big problem afflicting carbon taxes and cap-and-trade schemes alike is that not everybody wants to join the club. Carbon is best priced globally, partly because popular support will ebb if jobs move from virtuous countries to less virtuous ones, and partly because such schemes work much better on a large scale. William Nordhaus, a climate economist at Yale University, ►

► calculates that if every country in the world were to tax carbon, temperatures could be held to 2°C above pre-industrial levels at a cost of 1-2% of world income per year. If the scheme were confined to countries representing only half of global emissions, the two-degree target would be almost impossible to hit.

The obvious way to get countries to join a climate club is by threatening their exporters. Taxing imports at the border according to their carbon content, but giving credits for any carbon taxes already paid at home, might encourage exporting countries to levy their own taxes. But this would be brutally difficult to implement. Besides, border taxes on carbon would suppress trade, just as other tariffs do. And they might well prove illegal.

Count to three

A global carbon tax—or even one involving many countries—is likely to remain an economic theory for a long time. Certainly, nothing of the sort will be seriously discussed in Paris. Even so, there are three perfectly good things everybody could be getting on with right away. Two are humdrum, though no less worthwhile for that. The third requires greater ambition.

First, countries should be nudged to upgrade their promises for cutting emissions. In advance of the Paris conference, an untidy mess of pledges has been dumped on the table. Some countries say, fairly straightforwardly, that they will cut greenhouse-gas emissions by such-and-such a percentage compared with a particular year. But they pick different base years—inevitably ones in which their emissions were very high—to make their promises look better. Australia goes for 2005; Russia plumps for 1990, just before its heavy industries collapsed. Other countries do not even propose to hold emissions to a specific level. Some countries go in for statistical tricks, arguing, for example, that their efforts to prevent deforestation should be weighed more generously. The pledges should be made more comparable.

A good second move would be to ditch the carbon monomania. Tackling carbon dioxide, the most important greenhouse gas, is essential. Yet aside from its effect on ocean chemistry and the fact that it is warming the world, though so gradually that most people cannot detect it, carbon dioxide is innocuous. And the effects of emissions persist in the atmosphere for so long that even a drastic cut would have only a slight effect on climate change in the short term.

Carbon dioxide is not, however, the only greenhouse pollutant. Methane, black carbon (ie, soot) and hydrofluorocarbons

also warm the world a good deal. It has been estimated that if strong action were taken to suppress them, the world might be 0.6°C cooler by 2050 than it would otherwise be—a quick, fairly noticeable change. There is talk of regulating hydrofluorocarbons under the Montreal Protocol, which cracks down on ozone-depleting chlorofluorocarbons—an excellent idea.

The best target is black carbon, which comes off open wood fires and out of the exhaust pipes of unsophisticated diesel vehicles. This is an immediate killer, and it is easier to tackle than carbon dioxide. California cut black-carbon emissions by half in 20 years, mostly by cracking down on vehicles. More research on cheap, clean stoves for poor countries would be money well spent.

The most important thing of all is to innovate. Bill Gates, the philanthropist, laments that in all the discussions about climate change around the UN, almost nothing is said about research. Yet there is a crying need to develop technologies that are cheaper and more dependable than today's wind turbines and solar farms. Mr Gates has invested in new types of nuclear reactor—but he also holds out hope for artificial photosynthesis, which uses solar energy to make hydrogen from water. "It's not like the Manhattan Project," he says. "There are maybe a hundred different paths."

Mr Gates points out that annual spending on energy research in America is only about \$6 billion, compared with \$30 billion on medical research—and America is much more open-handed than many other countries. Energy firms do not spend a lot on research because there is no product differentiation in energy (electrons are electrons) and thus nothing exciting to sell until the price falls below that of the existing technology. So taxpayers will have to stump up most of the cash.

If more money were forthcoming, a good deal of it would be wasted on dead-end projects. But that is the nature of research and development. Only a few successes would be needed in order to avert calamitous climate change. And the funds that governments are currently pouring into subsidies for things like offshore wind farms are not doing much good. "We're spending almost all our money on wind turbines and solar panels that we know are not effective," says Bjorn Lomborg of the Copenhagen Consensus Centre. But then, he points out, people are used to doing things that make them feel good about climate change, rather than things that actually do good. ■

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More research on cheap, clean stoves for developing countries would be money well spent





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Israel and Palestine

Managing the situation or drifting towards disaster?

JERUSALEM AND RAMALLAH

The West Bank stands on the edge of a third intifada

ON NOVEMBER 24th a Palestinian man drove his car into a group of Jewish Israelis at a road junction north of Ramallah in the West Bank, injuring four of them and in turn being gravely wounded by police gunfire. By the standards of the West Bank, let alone those of Israel's neighbours, in particular Libya and Syria, it was a minor incident. But it is part of a pattern of violence that has developed since late September, when Israeli police and Palestinian worshippers clashed on the Temple Mount (the site of the al-Aqsa mosque) in Jerusalem. Since October 1st 23 Israelis and more than 80 Palestinians have died. Road-rammings and stabbings are the methods of choice for the Palestinian assailants, who then often lose their lives to Israeli bullets. Day after day the pattern is repeated, neither escalating nor petering out.

The "stabbing intifada"

Some call this a third *intifada*, or uprising, succeeding those that started in 1987 and 2000. Others reject that label, at least for now, though the situation may still deteriorate. The earlier outbreaks of violence were larger and bloodier; the second *intifada* lasted for more than four years and took around 1,000 Israeli and 3,000 Palestinian lives, though the weekly death toll was not much higher than now.

Israeli security officials talk down the danger. They regard the attacks as manageable and stress that the Palestinian Authority (PA), which has security and civil jurisdiction over the areas of the West Bank

where most Palestinians live, is as keen as Israel to keep the violence low-level and unco-ordinated. On the Israeli side of the separation barrier—a fortified line which in places follows the UN-drawn "green line" that ended Israel-Arab hostilities in 1949, but which also strays widely into Palestinian territory, including all of East Jerusalem—security is watchful but not intrusive. Although there have been a few attacks deep inside Israel, almost all have been in the West Bank or East Jerusalem; elsewhere life feels normal.

Still the violence refuses to fade, and the fear is constant that a single incident may provoke something worse. "There is a scenario in which this is just a wake-up call," says Husam Zumlot, an adviser to Mahmoud Abbas, the president of the PA. "But there is another scenario in which it leads to Armageddon." A poll last month by the Palestinian Centre for Policy and Survey Research found that most Palestinians now want a return to armed uprising.

There are two main reasons for the high level of Palestinian discontent. The first is a deepening conviction that Israel no longer has any interest in a "two-state solution" that would see Israel and Palestine coexist side by side. It is not hard to see why this view holds sway. Israel's prime minister, Binyamin Netanyahu, even said it himself in the run-up to this year's election, though he has since backtracked.

The reality is that his single-seat majority in the Knesset (parliament) gives him no scope to move towards a deal even if he

wanted to; his coalition includes right-wing and ultra-orthodox parties that will never accept one. Mr Netanyahu, who has warned of the dangers of "Hamastan B" being created on the West Bank if Israel withdraws, is in fact one of the more moderate leaders in his coalition. "Hamastan" is a reference to Gaza: in 2005 Israel withdrew from the Gaza Strip, where the Islamist group Hamas, after winning an election, threw out the moderate Fatah party, and has periodically fired rockets at Israel ever since. The recent emergence of affiliates of Islamic State in Sinai, which Israel restored to Egypt after 1979, is seen as a further warning by many coalition members of the dangers of handing back land.

Even from the left of Israeli politics, which still pays lip-service to the idea of a two-state solution, there is little pressure for actually crafting one. The chaos in Syria, Iraq, Libya, Yemen and, increasingly, Sinai, is reducing whatever impetus for peace might previously have existed. And new stumbling blocks to any solution have emerged. On top of the old, deeply intractable problems of how to administer Jerusalem, how to compensate Palestine with land for Israeli settlements in the West Bank and whether Palestinian refugees have a "right of return", there is now an impasse over security. Understandably fearful of the "Hamastan B" scenario, senior politicians say in private that Israel will never remove its security forces from the West Bank. But will the Palestinians ever accept their indefinite presence?

If the death of hope for a solution is one cause of the violence, another, perhaps even deeper, is the economic stagnation of the West Bank. Ramallah, the PA's capital, can look deceptively prosperous, buoyed by aid programmes and government jobs. The rest of the West Bank is far poorer. Annual GDP per person in the West Bank hovers around \$3,800, a tenth of the figure for Israel. It has no airport, so all goods and ►

► people must go via Jordan or Israel, a process which is bureaucratic, slow and subject to frequent interruption. Unemployment runs at 27%, but among the under-30s it is closer to 50%.

Palestinian politicians blame Israel for their near-strangulation, and they have plenty of reason to do so. Nine kilometres north of Ramallah sits probably the most ambitious business project yet started in the West Bank, the construction of Rawabi, a whole new city, intended to house 40,000 people in its first phase and more in the future. The first 700 homes have been built. But arguments with the Israeli authorities have meant that only a single-lane farm road leads in and out of this big new town, and how it will get enough water has not yet been resolved.

At least as big a problem, though, is the dismal quality of the PA itself. Its president, Mr Abbas, is 80; his elected term expired in 2009 but he has unilaterally extended it. He has no obvious successor. Fear of what will follow his departure is common, even though two-thirds of Palestinians want him to step down now. Scandals abound and, in a poll earlier this year, Palestinians said they were almost as unhappy about corruption as about the occupation itself. Meanwhile, the stabbings go on. ■



Iran's economy

Heavy lifting required

TEHRAN

The removal of sanctions will be good for Iran, but also disruptive

ADHERING so far to the terms of its nuclear deal, Iran is now busy taking most of its uranium centrifuges out of operation. That is a bitter pill for a regime that invested so much prestige in its atomic programme, but the only way to escape economic sanctions. Optimists hope that if Iran can trade more freely with the outside world, living standards will rise; investors hope for fat profits. In leafy north Tehran, Iranians back from America's west coast and eager young foreign fund managers discuss possible ventures over sushi.

No one doubts that Iran has potential. With almost 80m people, it is the world's 17th-most-populous market; and many Iranians lack even basic goods. The country has competent farmers, carmakers, drug firms and a fairly sophisticated service sector, making it less dependent on oil, now at rock-bottom prices, than other big producers such as Iraq and the Gulf states. The government's target of 8% growth over the next five years is less unrealistic than many rivals' five-year plans. Economists talk of Iran being able to imitate Turkey's transformation in the late 1990s.

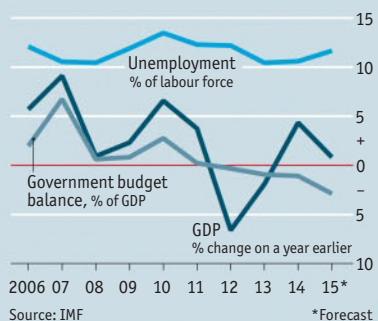
But by itself, sanctions relief will not transform the ailing economy. There are deep underlying problems, says Mohammad Khoshchehreh, a professor at Tehran University and a former economic adviser to Mahmoud Ahmadinejad (the former president), who now criticises his old boss. "Sanctions are just part of it; there is a history of mismanagement, too," he says.

Today Iran's most pressing problems include double-digit inflation, slow growth, low productivity and a stubbornly high unemployment rate of 10.6%. Joblessness is even worse among women, the young and urbanites. Mr Rohani inherited these problems from his predecessor, Mr Ahmadinejad, and has improved things somewhat. His election stoked confidence and he has returned to more orthodox economic policies, for example by spending less extravagantly than Mr Ahmadinejad.

Growth rebounded to 4.3% in 2014, a big improvement on the 6.6% contraction in 2012. Mr Rohani scrapped a populist housing programme, under which poor people were given free land to build on and the central bank printed money to provide them with mortgages. Inflation has duly fallen from around 40% to under 20%. But these are still modest achievements. Growth is expected to stall again, thanks to low oil prices, and unemployment is ris-

In need of a peace dividend

Iran



ing. The flabby state sector needs a lot more trimming, and the private sector yearns to be unleashed.

Sasan Rahnema, an Iranian businessman who returned from America in 2005, says there are more firms in Iran worth putting money into; he calls it a "cool situation". But most investors are still tentative. They may risk small sums in online start-ups that mimic successful foreign ideas, but they are not yet building big, expensive factories. Mr Rahnema has invested in Cafe Bazaar, an app store for Iran, and Divar, a classified-advertising site.

The government wants more foreign investment to boost its hard-currency reserves. But that would not be the main benefit of an open economy without sanctions. "It is more important for us to have managerial assistance, know-how, communication with the outside world and economic opening," says a worker in Tehran's financial sector.

Are the right reforms likely to happen? Few doubt that reformists within the regime would like to open up. The government is working on new contracts for oil investors which insiders say look appealing. But other areas, such as the hotel business, are murkier. "In Iran economics is inseparable from politics," says Saeed Laylaz, an economist and reformist former MP. Some hardliners are scared that competition will undermine their own rent-seeking businesses. Currently they make easy fortunes from construction (power helps when you want a building permit) and smuggling goods that are subject to sanctions. Some say that powerful figures are involved in bootlegging booze.

Mr Rahnema admits that the end of sanctions will be a mixed blessing for the average Iranian businessman, too. "We have to improve all-round quality to be able to compete with foreign firms," he says. Reformists are cautious not to overpromise, fearful of a backlash. Still, even low oil prices could have benign side effects for Iran. "The lower the price of oil, the weaker the government gets and the stronger the private sector," says an analyst in Tehran. "I'd like it to fall to \$20 a barrel." ■

Nuclear power in the Middle East

Wasting energy

CAIRO

For Egypt and others, the alternatives to nuclear power hold more promise

Egypt's "long dream" is coming true, says Abdel-Fattah al-Sisi, the president. Not the dream of a capable government or good public services—but the one in which the nuclear-energy programme started in 1954 finally produces a watt of usable power. The government signed a deal with Russia on November 19th to build its first nuclear plant in Dabaa, on the northern coast.

Nuclear power has gone out of fashion in much of the world. The share of electricity from nuclear reactors has fallen to 10.8%, from a peak of 17.6% in 1996. But China, Russia and India are all expanding their nuclear programmes. And several countries in the Middle East are pursuing nuclear power, creating what some have unfortunately called a "boom" in the region.

Some fear where this may lead—a nuclear-arms race pitting Sunni states against Shia Iran in pursuit of the bomb. The nuclear deal between Iran and the West has somewhat allayed those worries. Nuclear fuel in the region is mostly controlled by international suppliers. Moreover, there are legitimate reasons for the countries of the Middle East to seek alternative power sources. Demand for electricity is rising, along with pressure to lower carbon emissions; nuclear plants tick both boxes. Diversification away from fossil fuels must come sooner or later, say experts.

Short of oil and gas of their own, Egypt and Jordan want nuclear power to shore up the security of their energy supplies. They face big obstacles. The site chosen by

Jordan for two planned reactors, also to be built by Russia, lacks water (necessary for cooling) and local tribesmen object to it. Previous plans in Egypt have come to naught because of political upheaval and safety fears. Financing is also a challenge for these cash-strapped countries, though Egypt says it will pay for its deal with the savings from cheaper electricity.

The nuclear plans of Saudi Arabia and the United Arab Emirates (UAE) are more plausible. Both countries hope to free up oil and natural gas, now used to generate electricity, for export. To that end, Saudi Arabia has reached agreements with five countries, including Russia, to build 16 reactors by 2032. The UAE is already working with its partner South Korea on four planned reactors, which should begin supplying power in 2017. When the project is completed three years later, a quarter of the country's electricity needs are expected to be met by nuclear energy.

The projects in Saudi Arabia, which burns oil it could more efficiently sell abroad, and in the UAE, which got a bargain on its reactors, make some economic sense. But most of the reactors planned for the region would replace gas-fired plants, which are cheaper. Ali Ahmad and M.V. Ramana of Princeton University think a country like Saudi Arabia would benefit from nuclear power only if it could charge potential customers abroad several times the going price for its gas (otherwise, it is cheaper to burn it at home and forgo reactors). Importers, for their part, should stick with gas-fired plants so long as the gas price does not rise dramatically.

Over the long term, nuclear power could make sense as part of a low-carbon energy mix. But it is odd that Arab states neglect the most abundant clean energy source in the region—the blazing sun. By one estimate, solar power could provide Iran with 13 times its total energy needs—

and decrease its dependence on Russia, which has withheld nuclear fuel in the past. The tumbling price of photovoltaic panels makes solar more attractive: worldwide, more money was invested in it last year than in nuclear power.

Some Arab states are thinking this way. Morocco, which imports electricity from Spain, is building one of the largest solar plants in the world for less than the price of Jordan's two nuclear reactors. It hopes to get 42% of its electricity from renewables by 2020—and eventually to export power to Europe. Saudi Arabia and the UAE have also splashed out on large projects. Yet analysts say the Middle East, with its vast deserts, could be doing much more.

Less glamorous options also exist for countries looking to improve their power supplies. Fixing decrepit transmission lines in Iran would save more electricity than is produced by the country's single nuclear-energy plant. But there is more prestige attached to nuclear power, which is seen as a totem of technological progress—and which, of course, also allows for the development of skills that could one day be turned to bomb-making. ■

Protests in Biafra

Go your own way

LAGOS

Half a century after the war, angry Biafrans are agitating again

MOST Nigerians do not remember their country's civil war. A large majority were born years after the 30-month fight between Nigeria and the breakaway region of Biafra, which ended when the secessionists surrendered in 1970. Yet over the past month independence protests have erupted in cities across the south-east, where the self-declared state once was. Agitators say that this time they will not be beaten. "Biafra is a country to be restored," declares one of them. "We are determined to fight to the end."

This is a concern for Nigeria's new government. Secessionist organisations in Biafra have been agitating for years, but analysts reckon the scale of the current marches is unprecedented. Superficially, they were sparked by the arrest of Nnamdi Kanu, the outspoken head of the Indigenous People of Biafra (IPOB) movement, and director of Radio Biafra, a pirate station. But the grievances run deep.

Nigeria did not exist until British colonialists drew a line around hundreds of fractious ethnic groups dominated by the Igbo in the east, the Yoruba in the west, and the Hausa-Fulani in the north. The country's regions have jostled for power ever



He's got the power



▶ since. Predominantly Igbo protesters have not forgotten that tens of thousands of their people were killed before Biafra unilaterally declared independence in 1967. Between 1m and 3m people died during the war, many as the rebel territory was starved into defeat. In the 45 years since the war ended, they feel they have been blocked from senior political posts, denied public services, and impoverished by a post-war programme that they say auctioned off their houses and returned just £20 (\$320, in today's money) to them.

In the presidential election in March most south-easterners voted for the incumbent, Goodluck Jonathan, who comes from their region. He lost to Muhammadu Buhari, a Muslim from the north. "#NigeriaWillRot", Mr Kanu's radio station declared after the results were announced. Politicians have fired up impressionable agitators by claiming that the new government is marginalising Ibos, says Nnamdi Obasi of the International Crisis Group, a think-tank. In the oil-rich Niger Delta, a revolt beginning in the 1990s was focused more on winning power and a share of the spoils than on ideology. Many analysts think the same is true today.

So far the demonstrations have been mostly peaceful, though locals say shops have been looted and tyres set ablaze, and protesters claim police have killed several of their crew (the police deny those charges). That could change if Mr Kanu is killed or mistreated by Nigerian security agents. Boko Haram sets an unhappy precedent. The Islamist movement became a full-scale insurgency only after its leader, Mohammed Yusuf, was shot in police detention in 2009. Another worry is the impending end of a six-year-old amnesty for militants from the Delta. They could return to violence if it is not extended next month, spelling wider instability in the region.

Mr Kanu is not averse to playing with fire. He called for arms earlier this year and an unverified Twitter page in his name is full of extreme rhetoric and images of mutilated Biafrans, which Mr Obasi says often seem to be fake. Last week, his radio station inferred from a Boko Haram bombing that the "killing of Ibos in large scale has al-

The Radisson Blu siege

Murder in Mali

BAMAKO

After a hotel massacre, some encouraging signs

AFTER armed groups occupied the northern half of Mali and officers in the capital staged a coup in 2012, the country accepted generous international security assistance. A thousand French soldiers now monitor the jihadist plotters who lurk in the desert and the brush; over 12,000 United Nations peacekeepers are at bases in the capital, Bamako, or patrolling the north; and Mali's own forces are being improved. All of these forces (plus a few American commandos) were deployed after two young gunmen burst into the Radisson Blu hotel in Bamako on November 20th. Their collaboration was swift and co-ordinated, which undoubtedly prevented more killing, but the death toll was over 20.

In the days that followed, the Radisson remained closed to outsiders as French investigators gathered evidence before handing the process back to the Malians. It was grim inside, with blood stains and the smell of burning plastic. At other hotels, sweeps were under way as the government launched a manhunt for two or three suspects who may have aided the attackers.

The attack was claimed by an al-Qaeda-affiliated group al-Mourabitoun, led by the infamous Mokhtar Belmoktar, who attacked a vast gas plant in Algeria from across the border in Mali in 2013. Intriguingly, many witnesses said the attackers spoke English, or at least something that was neither Arabic nor local. Then a second group, the new Macina Liberation Front (MLF) from the Mopti region in the north-west, claimed responsibility for the attack, which Mali's president said was plausible. But the details of the investigation remain opaque.

This is the second time that Bamako has been attacked in the past year. The roots of the violence lie in the troubled centre and north of the country, where armed bandits and jihadists vie for control. The MLF in particular has shown its capacity for bloodshed by murdering imams who do not support it and attack-

ing hotels popular with foreigners.

Yet there are some hopeful signs. Malians are tired of the conflict. Villagers have started calling government forces after they are robbed by bandits, and helping soldiers find the aggressors. In Kidal, a northern desert region once thought lost, former rebels now run police operations against new violent actors. In Mopti, Malian forces are tracking down the MLF themselves. And development will continue; neither America nor Britain has any intention of cutting back aid in the wake of the attack. "We should honour them by continuing," said Gary Juste, the mission director for USAID.

The Bamako attack struck at one of the most trusted hotels in the capital, requiring an international response and revealing the fragility of government systems. But it also showed emerging strengths and a willingness to collaborate among the Malian authorities. More help, and a willingness to accept it, will be needed in the years ahead.



A blow to the heart

ready commenced". Many of his followers speak with an equally intimidating tone. "Give us Biafra or we all die getting Biafra," one of them proclaims.

The real concern is not alleged government brutality but poor governance. Despite huge oil wealth, Nigerians were twice as likely to be poor in 2010 as they were in 1980. Frustration is not confined to the south-east. Poverty and joblessness have

driven conscripts into the arms of Boko Haram terrorists, who want to establish a caliphate in the mostly Muslim north-east. Insurgents battled for self-rule in the Delta until they were paid to stop. Over the years, too many of Nigeria's politicians have been too busy filling their pockets to think of solving the common underlying problems, ignoring them until they got out of control. ■



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France at war

Coalition of the grudging

PARIS

A bellicose France tries to persuade its allies that the fight against Islamic State is a fully fledged war

IN THE aftermath of the Paris terrorist attacks on November 13th, the French framed their response with unambiguous martial resolve. President François Hollande declared that “France is at war”, and that Islamic State (is) would be “destroyed” without mercy. Images of French fighter planes taking off to bomb is targets in Syria from the aircraft-carrier *Charles de Gaulle* have been beamed out nightly on television news. After extra deployments, 5,000 soldiers now patrol the streets of the French capital.

This week Mr Hollande went on a whirlwind tour in search of allies for a “grand coalition” to fight the good fight. He has scheduled talks over seven days with the leaders of seven countries, including Barack Obama in Washington, DC and Vladimir Putin in Moscow. For the French, the murder of 130 people in their capital city constitutes an “act of war”, which requires a military response far beyond the American-led air strikes on Syria and Iraq during the past year.

Some support for Mr Hollande, who has tripled France’s air-strike capacity in the region, is already on its way. Britain’s David Cameron says he will ask Parliament to authorise air strikes on Syria. Mr Obama has pledged closer sharing of intelligence for target-selection, and an intensification of attacks on is. Yet Mr Hollande’s ambition is greater: he has said that he hopes to put together a “unique coalition”

to fight is, drawing Russia onside, and to bring Europe into the war, too.

On the first count, the French president has had to scale back talk of a formal coalition. But he is still hoping to find common ground with the Russians, themselves outraged by the deaths of 224 Russians on a flight over Egypt that was bombed last month. France, which only this year cancelled the sale of two Mistral-class warships to Russia, sees an unusual opportunity now to wage common war on is. The French talk of “annihilating” the terrorist group. The Russians speak of hunting them down “at any point on the planet”. To that end, Russia ordered its warships to share information about positions with the approaching *Charles de Gaulle*, in a spirit of co-operation.

Crowded skies

The risks of multiple unco-ordinated combat operations over Syria were underlined on November 24th, when Turkey shot down a Russian fighter jet (see next story). Yet the diplomatic challenge of resolving this is great, not least because of the gap between America, which regards Mr Assad as the problem, and Russia, which calls him a bulwark against is. France too has long insisted on Mr Assad’s departure. But it now wants to make the immediate common priority the fight against is.

In the short run, France may have a better chance of winning European support. It

has already invoked an EU mutual-defence clause. Besides the possible British air strikes, France may secure aerial intelligence from Germany. Its operations elsewhere may get help too. One of only two muscular military powers in Europe, France has been unusually willing to intervene abroad, partly because public opinion has not been scarred by misadventure in Iraq. Now it could be relieved in places such as Mali, where France has some 1,000 troops, and where terrorists murdered at least 20 hostages in a hotel last week. Germany may send 650 soldiers to Mali.

There is plenty of goodwill towards France across Europe right now, in part because of a chilling understanding that the massacre in Paris could have happened anywhere. Yet no other European leader is using the word “war”. Only Belgium is on anything like a war footing, after a four-day lockdown in Brussels in response to terror alerts. Paolo Gentiloni, Italy’s foreign minister, spoke for many when he offered to help France, but stressed that this “does not mean Italy should feel it is at war”.

Talk of war raises expectations of victory. “In a war, people expect a beginning, a middle and an end,” says François Heisbourg of the Foundation for Strategic Research. “But the struggle against terrorism is pretty endless.”

The French government is unapologetic. “The attacks were an act of war,” argues Manuel Valls, the prime minister; “not in a conventional sense, but it was war.” Framing the threat this way is meant partly to alert public opinion to the terrorist threat which, he says, will last several years, and could include chemical attacks. It also helped secure parliamentary approval for the extension of a state of emergency by three months. This has given the police sweeping powers to act without judicial authorisation: so far they have carried out ➤

► 1,233 searches, seized 230 arms and put 266 people under house arrest.

There have been some complaints about heavy-handed operations turning up nothing. But, for now, the French seem remarkably tolerant of the intrusions. As Mr Valls's Socialist government adopts measures hitherto regarded as the preserve of the political right, in line with public opinion, the civil-liberties left has become inaudible. In one poll, fully 84% of French said they would be prepared to accept further constraints on freedom. Brutally shaken by the terrorist attacks on the French way of life, the country seems ready to recalibrate its balancing of civil liberties and national security. It may find that the rest of Europe is not quite ready to do the same—unless, or until, threats turn into deadly attacks elsewhere. ■

Russia v Turkey

Over the borderline

Turkey shoots down a Russian jet, and Syria grows yet more complicated

WHEN Russia began bombing in Syria in September, it hoped the mission would be short and telegraphic. It is quickly getting longer and uglier. Last month Islamic State (is) affiliates downed a Russian airliner over Egypt. Then, on November 24th, Turkish jets shot down a Russian fighter-bomber near the Syrian border, the first hostilities between Russia and a NATO member since the end of the cold war.

Turkey said the Russian Su-24 had violated its airspace and was warned ten times before Turkish F-16s fired on it. Russia says its aircraft stayed over Syria. One pilot survived, but the other was killed, as was a Russian soldier involved in a rescue mission. A livid Vladimir Putin called the downing a "stab in the back" by "accomplices of terrorists", accusing the Turkish government of protecting is and allowing its oil trade to flourish across the Turkish border.

For Turkey, the clash follows months of frustration over Russia's intervention. Both countries are fighting is, but their priorities are often opposed. Turkey wants to overthrow Syria's president, Bashar al-Assad, and to prevent Syrian Kurdish militias from gaining territory. Russia wants to protect Mr Assad, its longtime client, and is friendly with the Kurds. "Turkey's strategy collapsed with Russia's involvement," says Nihat Ali Ozcan of the Economic Policy Research Foundation, a think-tank.

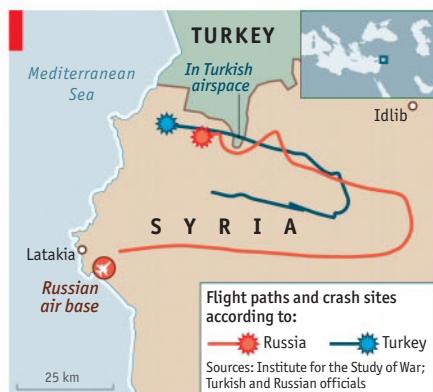
Turkish anger was compounded by Russian air strikes against villages inhabited by Turkomans (Syrians of Turkic origin),

which, Russia says, harbour Islamist terrorists. Turkey's foreign ministry summoned Russia's ambassador last week, and raised the issue with the UN Security Council. An estimated 1,500 Turkomans have fled Syria for Turkey. The Russian fighter-bomber was operating in a Turkoman region, but the decision to shoot it down was ultimately driven by border-security concerns, not sympathy for the Turkomans, according to Mehmet Yegin, a Turkish security expert.

In public, Turkey's NATO allies backed it. In private, many wondered whether Turkey could have been less provocative. Western leaders, including Barack Obama, sought to defuse tensions. On November 25th Turkey's president, Recep Tayyip Erdogan, said his country had "no intention of escalating this incident".

Mr Putin's anger aside, Russia has little interest in escalation either. "We're not planning to fight with Turkey," said the foreign minister, Sergei Lavrov. But Russia may strike back asymmetrically, says Fyodor Lukyanov, chairman of Russia's Council on Foreign and Defence Policy, a think-tank. For example, joint energy projects, including the proposed Turkish Stream pipeline, could be put on hold. Turkey imports 20% of its energy from Russia; it may find those contracts at risk. The number of Russian tourists who visit Turkey, currently 3.5m a year, is likely to decline: Mr Lavrov advised them not to visit because of an alleged risk of terrorism, and Russia's state tourism agency has banned tour operators from offering package trips.

Most troubling are the implications in Syria. François Hollande, France's president, visited Moscow on November 26th to drum up support for an anti-is alliance (see page 47). But NATO's solidarity with Turkey has rankled Russia, which could intensify bombing of Syrian rebels with ties to Turkey, or give more support to Kurdish forces. Russia has announced it will arm its air base outside Latakia with its most sophisticated air-defence missile, the S-400. In Mr Erdogan, Mr Putin has encountered a fellow illiberal strongman given to macho posturing. Both are known for letting national pride drive their decisions; neither will back down easily. ■



Sources: Institute for the Study of War; Turkish and Russian officials



Turning out the lights in Crimea

Power struggle

MOSCOW

A blackout on the Black Sea

UKRAINIAN nationalist saboteurs blew up transformers and cut power lines to Crimea on November 21st in an attempt to punish Russia for annexing the peninsula last year. Crimea relies on Ukraine for nearly all its electricity, and most of its 2m residents have been plunged into darkness, dependent on emergency generators and candles.

The blackout is the work of Crimea's Tatar minority, who mainly opposed annexation, and Right Sector, a far-right Ukrainian nationalist group. The two groups have been trying to blockade Crimea since late September. "We cannot feed the bandits who mistreat our compatriots in the occupied territories," says Mustafa Dzhemilev, the Tatars' historic leader. (Of course their compatriots suffer from the blockade, too.) Mr Dzhemilev demands the release of political prisoners in Russia, a concession Russia is unlikely to grant.

Ukraine's government seems incapable of fixing the power lines. A national guard unit sent to secure them for repairs pulled back after clashing with balaclava-clad activists. Unable to disperse the protesters and wary of seeming sympathetic to Russia, the authorities have halted trade with Crimea while they negotiate with the activists.

In response, Russia has threatened to cut gas and coal deliveries to Ukraine. The first undersea cables linking Crimea to Russia's electricity grid will not be completed until December 20th at the earliest. Crimeans, meanwhile, are as powerless as ever.

Refugees in winter

Icy reception

LESBOS AND SLAVONSKI BROD

The journey through Europe is miserable for migrants. It is likely to get worse

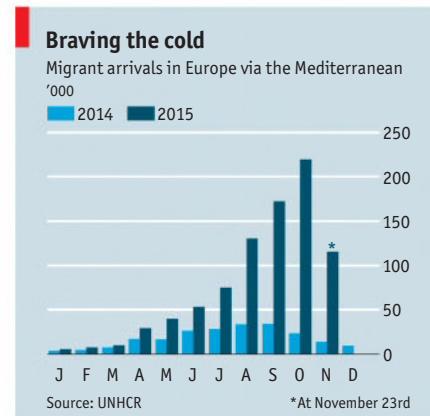
MOST teenagers only have to worry about acne, homework and heartache. Kasra, a 17-year-old boy from Afghanistan, faces more weighty problems. During the journey from his homeland to Europe, cutting through the mountains of Iran, Kasra says he "saw death many times" and at least one rape. Even in a transit camp in Croatia, he does not feel safe: he is unsure how other refugees or asylum-seekers would treat him if they knew that he was gay. "You are so lucky to live in Europe," he says. He wants to go to Germany and become a make-up artist.

During the onset of winter the number of migrants making the perilous journey across the Mediterranean normally drops. This year has been different. In October 2014, 23,000 people made the crossing; this October it was over 220,000—higher than the total for all of last year. Although numbers fell at the start of November, they are still around ten times higher than in 2014 (see chart). Yet as temperatures drop and migrants continue to stream in, Europe's response has been hopelessly inadequate. After the terrorist attacks in Paris on November 13th, it may get even worse.

Much of the increase in numbers is the result of the escalation of the crisis in Syria, thinks Itayi Viriri of the International Organisation for Migration, an intergovernmental body. Some 60% of those who have crossed the Mediterranean this year are Syrian. But increasingly others are coming from Iraq, Afghanistan, Somalia or Pakistan. Most make the trip via Turkey, either directly en route from their own countries or after being based there for a year or so. They then go across to Greece and up through the western Balkans.

This journey is becoming more difficult. Several countries in the Balkans have started to "push back" people; mostly because of the sheer numbers coming through, but also seemingly because of increasing anxiety over refugees since the Paris attacks. On November 19th Serbia announced that it would allow only those who were Syrian, Iraqi or Afghani to make the crossing. Macedonia and Croatia quickly followed suit. This has led to chaotic scenes at border crossings. Last week at Idomeni, in Greece, a thousand migrants from Iran, Bangladesh and Pakistan were stuck for four days. One group went on hunger strike; a dozen sewed up their mouths in protest. Around 150 have been sent back to Greece.

Provisions along the route are patchy. In



places such as Lesbos in Greece, asylum-seekers still depend largely on enthusiastic but inexperienced volunteers for food and clothing. Despite the fact that migrants have been arriving for months, facilities for shelter and medical care are still not adequate, says Elizabeth Collett, director of the Migration Policy Institute Europe, a think-tank. At Moria, a transit camp on Lesbos, some improvements have been made. But showers there are currently exposed to the elements. When beds run out, the refugees overflow into a disorganised tent village outside the fence, where some burn refuse to keep warm. Fights break out frequently; the sort of crowd-management security one expects at facilities dealing with refugees is inexplicably rare, says Peter Bouckaert of Human Rights Watch, an NGO.

More worryingly, many countries are

only belatedly preparing for migrants who will keep coming during the winter. At Slavonski Brod, a transit camp in Croatia, rows of large heated tents are full of bunk-beds for migrants to sit on for a few hours before being moved on. On a recent visit, the facilities were impressive, but the administration appeared disorganised. Migrants did not know where they were or how long they would be there for; the process of distributing warm winter clothes seemed to happen at random, if at all. Some wore flip-flops or summer shoes.

This means that as people move through Europe they are getting steadily sicker. "Their health clearly deteriorates," says Daniel Huescar of Médecins Sans Frontières, an aid group. Outbreaks of noroviruses and scabies are common, while aid workers in Serbia talk of mothers unable to look after their children after two weeks on the road in appalling conditions. Unless the EU responds quickly, it will face an even greater humanitarian crisis.

Lately, the EU has been more concerned with reducing the number of migrants arriving than with providing safe passage for those already there. On November 29th an EU-Turkey summit will be held in Brussels. In exchange for €3 billion (\$3.2 billion) in financial assistance and a package of political goodies, including restarting its stalled EU accession application and speeding up visa-free travel for its citizens, Turkey is expected to encourage the refugees to stay on its territory. It may also grant work permits to Syrians, and provide better access to health care and schooling.

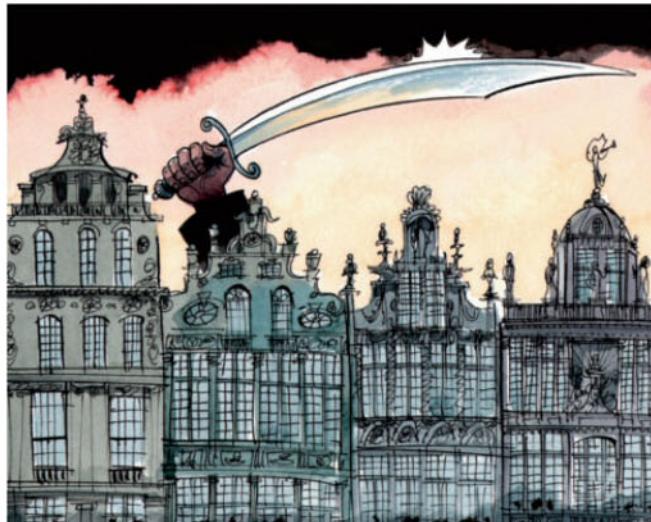
But no one working with refugees in Turkey thinks that the country will be able quickly to reduce the flow of migrants. People like Kasra will continue to come. Political pressures in Europe may make caring for refugees an increasingly unpopular cause. But allowing refugees to suffer and letting chaos persist along the migration route is not a solution. ■



A winter's tale

Charlemagne | A continent like Belgium

The country is politically splintered and vulnerable to terrorism. So is Europe



BRUSSELS, wrote Tony Judt, is “a metaphor for all that can go wrong in a modern city”. The late historian, writing in 1999, was referring to the civic neglect that has left much of the Belgian capital, home to most institutions of the European Union, an unsightly mess of concrete and roadworks with the worst traffic in Europe. But his words could just as well apply to the string of terrorist plots and attacks that has provided Brussels, and some other Belgian cities, with a scabrous reputation as an incubator of jihadi ideology and a paragon of law-enforcement incompetence.

Belgium has long been the butt of European jokes, thanks in large part to its dysfunctional politics. In 2010-11 squabbles over the rights of Flemish-speakers on the outskirts of Brussels held up the formation of a government for 589 days, a world record. But the terror threat has exposed the darker side of Belgium’s maladministration, in the form of uncoordinated security services and neglected areas like Molenbeek, a down-at-heel Muslim-majority commune in west Brussels. After the Paris attacks, French officials sniped at their Belgian counterparts on learning that several of the perpetrators had hatched their schemes in Brussels. Two had been questioned by Belgian police earlier this year. One of them, Salah Abdeslam, fled to Brussels after having driven three of the Paris suicide-bombers to their destination.

Now Brussels is enduring its own threat. On November 21st Belgian officials raised the terror alert in the capital to its highest level, citing fears of multiple Paris-style attacks. The “lockdown” was not the near-curfew portrayed in some foreign media. Yet schools, shops and underground transport were closed for several days, concerts and sporting events were cancelled and armed troops patrolled the streets. It is hard to think of a European precedent for such a suspension of civic life, and it is not over. A series of police raids failed to net Mr Abdeslam, and Brussels will remain on high alert at least until November 30th.

National unity is rarely esteemed by Belgium’s fractious politicians, even in times of crisis, and so it proved this week. A Flemish-nationalist MP accused French-speaking Socialists of allowing “Islamic barbarity” to take hold in Brussels. Local politicians, including the mayor of Brussels, slammed the federal government for imposing such strict measures on the capital. Foreigners, too, have engaged in what the local press terms *le Belgum-bash*

ing. Belgium used to be a state without a nation, quipped *Le Monde*. Now it is becoming a nation without a state.

Some of the barbs are overdone. Belgian police and intelligence agencies have not always worked in harmony, but that is true everywhere. Recent legislative changes have improved co-operation. At the European level, Belgium has enthusiastically pushed for intelligence-sharing; it is countries with heftier secret services, such as Britain and France, that have been reluctant to share information, though that too is changing. As for the lockdown, without access to the intelligence that spurred Belgian officials to place Brussels on high alert, it is hard to assess their decision. But less than a fortnight after 130 people were murdered in Paris, most Bruxellois will surely be in a forgiving mood.

For years outsiders have seen Belgium as a microcosm of Europe: first, in its expression of the dream that domestic differences can be dissolved in a federalist soup; subsequently as an example of north-south mistrust. Recent events provide a third prism: like other European countries, Belgium is floundering in the face of a domestic terror threat. Here, as elsewhere, budget cuts have left police and intelligence services short of resources, including Arabic-speakers. Security officials have a watch-list of some 800 potential or actual foreign fighters, but, like their counterparts in Britain and France, do not have anything like the manpower needed to monitor them all. More funds have lately been devoted to watching people returning from Syria, but at the expense of other intelligence concerns, such as counter-espionage.

Meanwhile, Belgium is dealing with the legacy of its failure to integrate large parts of its Muslim minority. Fairly or otherwise, Molenbeek has become a global byword for jihadism, but similar problems exist throughout the country: a clownish (and now defunct) Antwerp-based group called Sharia4Belgium inspired dozens of young Belgians to leave for Syria. Immigrants and their immediate descendants are far more likely to be unemployed than non-migrant Belgians; their children perform poorly at school. A higher share of the Belgian population has left to join the fight in Syria or Iraq than from any other EU country.

We are all Belgians now

Yet no European country with a large Muslim minority has solved the problem of integration. Britain and France take different approaches, but each has seen scores killed in “home-grown” terrorist attacks. In Sweden, towns like Gothenburg are partially segregated; this week the government executed a screeching u-turn on its asylum policy. Even Germany, which is embarking on its own experiment in integration after having welcomed hundreds of thousands of Syrian refugees, has struggled to accept that it is a land of immigration rather than of *Gastarbeiter* (“guest-workers”). In each of these countries and others, anti-immigration parties are climbing in the polls; in some, they top them.

Twenty years ago the main terrorist threat in Europe came from regional separatists. Ten years ago it was spectacular attacks by al-Qaeda, or groups inspired by it. It is now evolving into something messier, directed against softer targets, organised across borders and linked to gangland crime and weapons-trafficking. (Olivier Roy, a French expert on extremism, speaks of “the Islamicisation of radicalism”.) This raises urgent questions for officials across Europe, not least over how far they are willing to share intelligence and data with their counterparts elsewhere, whether within the EU or in other formats. It is time to stop bashing Belgium. Much of Europe is in the same boat. ■



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The spending review

The unsubtle knife

Though the latest round of cuts will be shallower than billed, the British state is taking on a different shape

IT DOES not sound very austere. By 2020 spending by the British government is likely to be slightly lower in inflation-adjusted terms—perhaps 1%—than in 2010, when the Conservatives came to power. “I don’t think there’s a family or business that couldn’t do that—and I don’t think government...should be any different,” David Cameron, the prime minister, has said.

In reality things are tougher. Under plans outlined by George Osborne, the chancellor, on November 25th, Britain will see a decade-long pause in public-spending growth, the longest-running squeeze on Leviathan since the 1950s. Spending will fall from 45% of GDP in 2010 to 36% in 2020, the biggest tightening by any big, rich economy over that period. What does all this mean for the British state?

Mr Osborne was helped by new forecasts from the Office for Budget Responsibility, a government watchdog, which suggested that higher tax revenues would give him £27 billion (\$41 billion) more to spend than previously thought. The chancellor used this wriggle room to cancel proposed cuts to tax credits, wage top-ups for the working poor, whose axing had proved controversial. Tax credits are to be phased out anyway as part of an overhaul of welfare; nonetheless, the screeching U-turn provided most of the next day’s headlines.

Beneath that announcement, bigger changes to the shape of the state were

afoot. To Conservative cheers, the chancellor pledged to maintain spending on defence and foreign aid, and made much more costly promises to protect pensions and the schools budget. Funding for the National Health Service (NHS), which eats up one-third of departmental spending, will rise by £10 billion in real terms by 2020. A few large ringfenced budgets will end up forming a much bigger slice of the spending pie (see chart).

Pensioners have every reason to be delighted: the state pension will increase by 2.9% from April 2016 at a time when prices are falling. But the young are not doing as well as it seems. By 2025 the number of

people aged 14 and under will have increased by 7%. Schools will face rising costs, thanks in part to their need to make higher pension contributions. The Institute for Fiscal Studies (IFS), a think-tank, reckons that school spending per pupil is likely to fall by 8% in real terms in 2015-20.

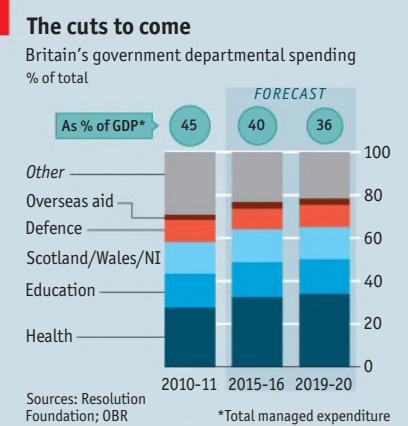
It is a similar story in health care. The elderly are expensive to look after—and the very elderly are very expensive indeed. An 85-year-old receives five times as much NHS spending as a 40-year-old, and double that of a 70-year-old. This matters because, according to the King’s Fund, a think-tank, the number of over-85s will roughly double by 2032, and with them the number of Alzheimer’s and cancer patients will rise.

And that’s the good news

After adjusting for an ageing population, per-person spending on the NHS in England has fallen since 2010 and is likely now to stagnate, says Mark Dayan of the Nuffield Trust think-tank. “The NHS will still be run on a tight budget by the standards of the developed world,” he says.

Departments not protected by Mr Osborne currently account for only around one-third of departmental spending. Having fallen by 20% in the previous parliament, their budgets will shrink by a similar proportion by 2020. There is some fat to trim. Officials in local government talk of having stopped juicy donations to charities that just so happened to be political allies of their predecessors. A report on the Foreign Office, which saw its day-to-day budget cut by one-quarter in 2010-15 (but was spared this time), found that “residential premises for most...staff overseas are likely to be humbler”—no tragedy.

To make more such savings requires central government to make smart decisions, argues a paper by the Institute for ►



► Government. It points to the formation in 2011 of the Government Digital Service, which created Gov.uk, an easy-to-navigate website that makes it simpler to access public services. Last year the digital task-force saved the government £600m.

But large parts of the state are not looking much leaner or meaner than in 2010. One big source of inefficiency, public-sector procurement, has been left untouched. One pound in every three spent on public services goes to private firms, which if managed well provide services more cheaply than the state. But there is still no central oversight of public-service markets, the IFG says. The result is money-wasting cock-ups, as when G4S, a security firm, failed to provide the full number of guards it had been contracted to supply for the London Olympics in 2012. With the number of civil servants down by 20% since 2010, oversight will be even trickier.

Since efficiency savings are not enough, departments will have to ration services. Getting people to pay for things that were once free is one solution. The Department for Business, Innovation and Skills, facing a 20% budget cut in 2015-20 on top of a 25% cut since 2010, is squeezing university funding. Next year poor students will no longer get a grant to pay for room and board; instead they must take out a loan.

Elsewhere, in response to a budget cut of about 30% since 2010 the justice department has ordered magistrates to impose court-use charges on adult offenders. Defendants pay a lower fee if they plead guilty. All this allows public services to be maintained, while taking the cost of providing them off the books.

Even then, unprotected departments will have to cut some services altogether. Sarah Hayward, the leader of Camden council in London, says that her local authority is increasing the number of children that each social worker is expected to look after, a move which so far it has resisted. Across all local authorities, which face a 77% cut in their government grant in 2010-20 according to the Resolution Foundation, a think-tank, the number of children's centres began to fall last year.

Cutting the supply of public services rarely quells demand for them. Nine out of ten NHS trust finance directors surveyed by the King's Fund reckon that cuts in social-care budgets—for sheltered housing and care homes, for instance—are adversely affecting health services. In September the number of patients who should have been transferred from hospital to another form of care, but were not, was 26% higher than it was four years ago.

Mr Osborne has allowed local authorities to increase council taxes by 2% to fund extra social care; overall, that could raise £2 billion a year by 2020. Yet the poorest councils, which have the highest demand for such services, will find it most difficult

to raise taxes. And even if all that were raised, it is unlikely to offset past cuts.

Mr Osborne's promise to run an overall budget surplus by the end of the current parliament is driven by political rather than economic logic. The deadline is determined by the timing of the next election. And since the target includes investment spending, it will worsen Britain's long-standing problem of insufficient capital spending on things like roads and railways.

The counterargument, that running a budget surplus is the only way to pay down the public debt (currently 80% of GDP), does not hold either. Britain could probably run a deficit of 2% of GDP up to 2020 and still reduce its debt ratio, since the economy is forecast to grow at a decent clip. Though Mr Osborne's austerity plan has not been as damaging as some feared, it is causing more pain than needed. ■

Housing

Giving and taking

A mixed bag of policies to solve Britain's housing crisis

IN A mini-budget delivered on November 25th George Osborne, the chancellor, declared three times that the Conservative Party was the party of the "builders". Mr Osborne wants a new golden age in British housebuilding, something that is sorely needed. The construction of homes has been below its long-term trend since 1990; prices have risen by 60% in real terms since 2000, faster than most other rich countries. To get the builders moving, Mr Osborne unveiled a range of proposals. They mix



Can we fix it?

method with madness.

The chancellor plans to double the housing budget, to build 400,000 "affordable" homes by 2020. That would bring Britain close to its overall building target of 250,000 houses a year, perhaps keeping its soaring prices in check. He said he was embarking on the "biggest affordable-house building programme...since the 1970s". But the government will go about building in ways that would be unfamiliar to Britons 40 years ago. Back then local councils erected over 100,000 houses a year, almost all for rent. Now Mr Osborne sees government-supported housebuilding coming through private providers, who would then sell the new houses.

The chancellor reiterated a manifesto commitment to build 200,000 "starter homes", dwellings for first-time buyers sold at a 20% discount from the market price. The government had planned to fund the discounts on these houses by relieving builders of costly planning rules. Now it will also pay them £2.3 billion (\$3.5 billion) in subsidies.

In addition, Mr Osborne wants to boost "shared ownership", where people buy a chunk of a house and pay rent on the rest (with the option to buy in full later). At present, there are many restrictions on shared ownership: councils can exclude those who work outside the local area, for instance. Now anyone with a household income of less than £80,000 (or £90,000 in London) will be eligible. The hope is that 135,000 such homes will be built.

Yet these plans are not without their drawbacks. Housebuilders will be encouraged to provide dwellings to buy rather than to rent. This is a problem for low-income families, for whom cobbling together a deposit is tricky and mortgage-interest rates are higher. The government is capping the sale price of a starter home at £450,000 in London (about 15 times the average salary there) and £250,000 elsewhere (11 times the average); housebuilders have little reason to sell at much below that.

And another proposal may counteract any price-dampening effect. In perhaps his pottiest policy yet, the chancellor will offer interest-free mortgages for up to 40% of the value of new-build homes in London, to first-time buyers who are able to put down a 5% deposit. The idea is that by boosting purchasing power, home-ownership will rise. All it will actually do is gee up prices.

Britain's Byzantine, murky planning system makes housing supply unresponsive to demand. The number of planning approvals for houses is one-third lower than before the recession, even though prices are bubbly again. Mr Osborne mentioned planning reform in his speech, but offered no details. Until that changes, efforts to deflate the housing bubble will not get far. ■



Defence and security

More gear, maybe more fighting?

A big review of the armed forces—days after Paris and days before a probable decision to bomb Syria—reasserts British military power

FOR David Cameron, the publication of the Strategic Defence and Security Review on November 23rd was a case of grim good timing. It came ten days after the horrific shootings and bombings in Paris by Islamic State (is) terrorists. Indeed, the prime minister announced the review's results in Parliament just a few hours after coming back from Paris, where he pledged full support for François Hollande's "war" against is. His statement also came three days before he returned to the House of Commons to initiate a debate, ahead of a likely vote next week, on approving British air strikes against is in Syria.

What recent events have shown is that global security threats remain clear and tangible. Mr Cameron embarrassingly lost a Commons vote in August 2013 to authorise the use of force against Syria, partly because the Labour opposition ambushed him but also because many in his own party had reservations. That vote explains why Britain is now in the awkward position of bombing is in Iraq (at the invitation of the Iraqi government), but not in Syria, even though is does not recognise the border and its main base is Raqqa in Syria.

Even before the Paris attacks the mood had changed. Tory doubters, including Crispin Blunt, chairman of the House foreign-affairs committee, now think that the conditions necessary for endorsing British military operations in Syria have been met. The Labour leader, Jeremy Corbyn, is instinctively against and now wants his

shadow cabinet to debate and agree on a party line. But many Labour MPs, including some shadow ministers, will support Mr Cameron's plan in any event. The government is accordingly confident of securing a parliamentary majority to join America and France in bombing is in Syria.

The new mood also coloured the defence review. The previous one in 2010 had implicitly assumed that state-on-state warfare was an outlandishly remote eventuality, justifying sharp cuts in defence spending. The new one reflects not just the rise of is but also the change since early 2014, when Russia redrew the map by using military force in Ukraine. It is no longer possible to dismiss the risks of war.

Loaded

Against this background, the review set out to repair some of the damage caused by its hastily cobbled-together predecessor. It began by confirming the government's commitment to the NATO target of spending at least 2% of GDP on defence. The target may be met by accounting wheezes, such as chucking pensions into the pot. But the promise, made under American pressure, still came as a pleasant surprise to those who feared more defence cuts.

The main winners from the review were the intelligence services, special forces and the Royal Air Force (RAF). As Mr Cameron promised after Paris, staff numbers at the GCHQ intelligence agency and in the security services are to rise, by 1,900

in all. The SAS and other special forces will have £2 billion (\$3 billion) more for fancy new kit. The RAF gets a £12 billion rise in its ten-year equipment budget, to £178 billion.

Most of that will go on accelerating the arrival of 24 stealthy F-35B fighter jets, ensuring that the navy's two new aircraft-carriers both have at least a squadron of F-35s by the time they are deployed in 2023. It will be two decades before the full complement of 138 F-35s is operational, but the gap will be covered by extending the life of older Typhoons. This is a big shift since the 2010 review, when only one of the new carriers was expected to enter service. The Libyan air campaign in 2011, just a few months later, was a timely reminder of the unique ability of aircraft-carriers to project power.

Another change is a £2 billion programme to buy nine Boeing P8 maritime-patrol aircraft. The 2010 review left Britain without an aerial anti-submarine capability. With Russian subs once more probing NATO's defences in the north Atlantic, Britain has needed French, Canadian and American help to patrol its own territorial waters. The lack of maritime-patrol aircraft also risked the credibility of the submarine-borne Trident nuclear deterrent, which the defence review confirmed is to be renewed, at a cost of some £31 billion.

In relative terms, the navy and the army have lost out. Britain's admirals had hoped to recruit another 4,000 sailors; they will get only one-tenth as many. Michael Fallon, the defence secretary, claims that "efficiency savings" will compensate. Nor will the navy be able to buy all 13 of the Type 26 frigates it wants. Five of its new ships are likely to be smaller, cheaper models. The "Type 26-lite", as it has been dubbed, will be fine for most purposes, though it may not have the edge against a sophisticated opponent such as China or Russia.

The army is to be reorganised to create two 5,000-strong "strike brigades" that can be sent off to fight at short notice. Mr Fallon insists that the new brigades will not come at the expense of Britain's ability to deploy a heavily armed force of 40,000, as in Iraq, or to keep 10,000 troops in the field indefinitely, as in Afghanistan. But the underlying message is that rapid-reaction forces are in and that large numbers of boots on the ground are out, at least for now.

This defence review will go far towards restoring Britain's reputation as a serious military power, ending American sneers at its declining capability. What is less sure is that Britons still have what the outgoing chief of the defence staff, Sir Nick Houghton, calls the "courageous instinct" to use force when necessary. Mr Cameron will win his vote on Syria. But as the agonising debate over it has shown, public opinion has a stronger non-interventionist streak than it did, especially if it comes to putting boots on the ground. Only is could, perhaps unwittingly, change that. ■

Bagehot | George Osborne, liberal idealist

The chancellor of the exchequer is remaking the state according to his own political philosophy



GEORGE OSBORNE is the ultimate Westminster operator. On November 25th, setting out the government's five-year spending review, he praised colleagues, ditched unpopular cuts to tax credits that had formed the centrepiece of his budget only five months ago, cracked jokes—"We're not going to make that mistake again," he deadpanned of a botched government attempt to privatise forests in the last parliament—showered Tory-leaning pensioners with cash and favoured MPs with oinking heaps of pork. A grant here, a spending guarantee there and a kind word for the other guy: the chancellor of the exchequer, who talks of professional politics as a "guild", was plying his trade with panache.

It is easy to see why Mr Osborne, with his hurricane of micro-announcements, feints and sleights of hand, is compared to Gordon Brown, his predecessor-but-one. Like Mr Brown as chancellor, he craves the premiership and is prone to short-term fixes and populist gambits. Yet when Mr Brown became prime minister in 2007, it transpired he had little long-term vision. The vacuous, headline-chasing mores of that period were captured by "The Thick of It", a sardonic television comedy featuring a hapless minister for "social affairs and citizenship" whose grand plan was a "Fourth Sector Pathfinder Initiative". Mr Osborne walks in the footsteps of a Moses who descended from the mountain with an Etch A Sketch.

Is he condemned to the same fate? The consensus is: yes. On the left Mr Osborne is seen as an aristocratic, louche, post-moral dandy. On the Tory right he is considered a metropolitan, louche, post-moral luvvie. Both sides start from the assumption that the chancellor has no big plan and few fixed beliefs. This is wrong. Mr Osborne is a liberal idealist. He bombards aides with accounts of the great Victorian reformers. He badgered Bagehot to reread Mill's "On Liberty". Consider the few subjects on which he differs from David Cameron, the prime minister from whom he is otherwise inseparable. Unlike his boss, Mr Osborne was an early Tory supporter of gay reproductive rights, cried at Margaret Thatcher's funeral and has little time for tax breaks for married couples or Sunday trading restrictions.

From this outlook stems a vision of the state evident despite Mr Osborne's tactical tacking. New Labour, the political project

that he filleted for lessons for the Tories, governed in the tradition of Jean-Jacques Rousseau. Its underlying view was that a civilised society needed the state's corrective hand. Because he differs from this, many Labour types consider the chancellor a follower of Thomas Hobbes, with his brutal, dog-eat-dog vision of human nature. The chancellor has, it is true, sometimes nurtured this image, characterising welfare claimants as lazy scroungers, for example. Yet Mr Osborne is broadly loyal to the third pole: John Locke, who believed that people tend to be decent, wise and fair. His is an outlook essentially optimistic about human nature but wary of state bloat.

That comes across in his policies—including those outlined on November 25th. The chancellor transferred to councils responsibilities for homelessness and social care and announced that he would wind up their government grant. But he is also letting those authorities control and retain local business-tax receipts. The essence of his vision is thus to scale down the great Whitehall subsidy machine, pushing responsibilities down to citizens, companies and local authorities. Hence the cuts to tax credits should be partly mitigated by a higher minimum wage. Big cities outside London are rapidly gaining powers over their public services and economic fortunes. Housing benefit is being cut as more support is going to housebuilders. Grants to trainee nurses and students are being replaced with loans, and state services increasingly carry user charges (for visa applications and, in some cases, court time). Big companies will soon foot the bill for the apprenticeships from which they benefit. Mr Osborne, in other words, is reducing government's compensatory role.

From the subsidy state to the enabling state

Instead the chancellor proposes an enabling state: one that, though offering a limited safety net, concentrates on creating the conditions in which actors can solve their own problems. Thus in 2013 Mr Osborne pushed successfully to lift a cap on university student numbers, has cut corporation tax (and wants to cut it further) and is now pumping cash into infrastructure and science. He often fails to live up to the credo; he has done too little to curb old-age and middle-class welfare, spur house-building, or plug gaps in skills. Yet this does not detract from the vision that—once the thick layers of hyperactive political pragmatism are stripped back—serves as the lodestar of his chancellorship.

All of which is revealing of what Mr Osborne would do as prime minister. The question is more than academic. The chancellor's influence already extends far across the government (he is prone to pointing out to new MPs how many of his protégés are in powerful jobs). Moreover, Labour's response to his spending review, in which the shadow chancellor read from Mao Zedong's "Little Red Book", epitomised a pattern of left-wing self-indulgence that increasingly marginalises the opposition. The chancellor stands a good chance of running Britain for a while if, as seems probable, he succeeds Mr Cameron in a few years. If he does, his priority will be to win the next election. But in the process, and especially if he succeeds, the outcome could be a state transformed: committed to forging a benign environment for individuals, firms and municipalities, but less willing to meddle in how they proceed—or to catch them when they fall. ■

Correction: Bagehot claimed on November 7th that the House of Commons European Scrutiny Committee is often unable to meet because it is inquorate. This is wrong, although average attendance in the previous parliamentary session was 49%. Sorry.



From dictatorship to democracy

The road less travelled

How to make the most difficult political transition of all—and how not to slip back again

WITH the last votes from Myanmar's farthest corners finally counted, the country's electoral earthquake has been officially confirmed. On November 8th the National League for Democracy (NLD), led by Aung San Suu Kyi, won 77% of the seats on offer, while the ruling army's proxy, the Union Solidarity and Development Party, only managed a humiliating 10%. Considering that Myanmar was ruled by a brutal military dictatorship just five years ago, and the NLD was banned, with many of its leaders in prison or under house arrest, this is an exhilarating turnaround. The NLD's landslide gives it a majority in both houses of parliament, and puts it in pole position to pick the next president.

Myanmar's swift, albeit incomplete, transition from dictatorship to democracy is particularly heartening because of failures elsewhere. During the same period, for instance, the Arab spring has wilted. Of all the countries that witnessed popular revolutions in 2011, Tunisia alone remains relatively stable and has held successful elections. Egypt is probably more oppressive and violent than before; Syria and Li-

bya are war zones. Myanmar's neighbours have floundered, too. Thailand elected a charismatic young prime minister, Yingluck Shinawatra, in 2011, only for her to be overthrown in a military coup three years later. Cambodia and Malaysia both held flawed elections in 2013 that were largely rejected by the opposition, plunging them into crisis. Vietnam and China continue to lock up dissidents and show no sign of letting the people choose their own rulers.

Fake it till you make it

For most countries that attempt it, the shift from dictatorship to democracy seems as difficult as ever. As Russia, Thailand and several other places have shown, there is no guarantee that a newborn democracy will survive or mature. Myanmar's progress, though impressive so far, is anything but secure. So it is worth asking: what makes for a successful transition?

For a start, any elections, even if flawed or ignored, can put a country on the right path. Nowadays, almost all dictatorships and authoritarian regimes at least go through the electoral motions—such is the

homage vice pays to virtue. They rig the results, of course. But sham democracy often whets people's appetite for the real thing. That was what happened in Myanmar, where successive military governments held and won several bogus elections and referendums from 1990 onwards. The NLD boycotted some of them. But pressure grew to make the elections cleaner, and when they were just about fair enough, the NLD seized its chance.

Brazil and Mexico had similar experiences. In the former, the military regimes that followed a coup in 1964 held elections that they could control and win. But as the generals lost popular support, so these elections became harder to manipulate, until in 1985 they lost the presidency to a civilian, Tancredo Neves, and accepted defeat. In Mexico the authoritarian regimes of the Institutional Revolutionary Party (PRI) enjoyed the legitimacy of elections which were rigged when necessary. But, again, phoney ballots created a momentum towards real democracy—and attempts to resist became ever more farcical.

In 1988, with the opposition leader ahead early in the count on election night, Manuel Bartlett, the minister in charge of the count, revealed that the computers tabulating the results had mysteriously crashed. "Se cayó el sistema," (the system has crashed) he announced, and the next day the regime awarded itself a victory. It became a catchphrase for electoral fraud, and all that was wrong with one-party rule, and after an impartial electoral au- ➤

uthority was set up by the government in 1996 the PRI lost power at the next poll, in 2000. Mexico, for all its drug wars, has been a genuine multiparty democracy ever since.

Bowing to the coming power

This suggests another common feature of successful transitions: a degree of consent by the regimes being replaced. In Myanmar it was Than Shwe, probably the cruellest of the military dictators, who nonetheless started reforms in the early 2000s, responding to popular opposition led by the NLD as well as sharp economic decline. He introduced a constitution in 2008 that provided for a new parliament and elections, and resigned in 2011 to make way for Thein Sein, who was willing to work with Miss Suu Kyi. The constitution gave the armed forces huge undeserved privileges, such as a quarter of parliamentary seats. That was unfair, but many argue that it gave the generals the courage to allow reform in the first place. They knew that they had a stake in the transition and could, to an extent, control it.

Something similar happened in South Africa in the 1990s and in Spain in the 1970s. In South Africa the ruling National Party decided gradually to dismantle the apartheid system it had created, under which blacks were denied the vote and countless other rights. It negotiated a transition to democracy that included safeguards for the white minority, such as a constitutional guarantee that their property would not be seized. Reassured, whites voted to give up power.

In Spain, as in Myanmar, the dictator handpicked his successor. When General Francisco Franco chose King Juan Carlos as the next ruler, there was little to suggest that he would start down the path to democracy. But the king chose a prime minister, Adolfo Suárez, who started to lift the bans on political parties and hold elections. The confidence that officers felt in Juan Carlos, who had strong links with the armed forces, proved crucial in 1981 when some Francoist generals attempted a coup and Antonio Tejero, a lieutenant-colonel in the Civil Guard, took the parliament hostage. They expected the king to back them. Instead, the monarch spoke up for democracy, and thus gained popularity.

The alternative to reform from within is armed rebellion from below. Sadly, history shows that violence usually begets further violence. Granted, the American revolution was pretty successful. But overall, peaceful mass movements have a better record in persuading oppressive regimes to change. The NLD, founded in 1988, played this role in Myanmar, as did the African National Congress in South Africa and the parties led by the "two Kims" in South Korea (for an obituary of Kim Young-sam, one of the architects of civilian rule in Korea,

see page 37). In communist Poland the dissident trade union, Solidarity, led by Lech Wałęsa, attracted a quarter of Poles as members, undermining the regime's claim to speak for the people. Suharto, Indonesia's strongman-president from 1967 to 1998, yielded to protests during an economic crisis. Not all these mass-movements were entirely peaceful, but it was the huge crowds that won the day, not the petrol bombs. And peaceful mass-movements are much likelier to foster civic engagement, making it easier for democracy to flourish after the old regime has gone.

Institutions that can mediate between regimes and their critics help, too. Myanmar Egress, a think-tank set up in 2006 when politics was deadlocked, suggested various ways to get things moving again. One of its founders had been in the NLD and another was trusted by the army, since his parents had taught at the Defence Services Academy, Myanmar's equivalent of America's West Point. Egress thus acted as a bridge. It engineered the first official meeting between Thein Sein and Miss Suu Kyi in 2011. Tunisia's singular success is partly due to the efforts of its national dialogue quartet, a disparate collection of unionists, employers, lawyers and human-rights activists. They recently won the Nobel peace prize.

Good neighbours and sponsors also feature in successful transitions. The rapid collapse of communism in eastern Europe was ably assisted by the European Union. Countries under the Soviet boot looked west for a democratic example to copy and a wealthy source of support. Similarly, Mexico's still-incomplete democracy was buttressed when it joined America and Canada in the North American Free-Trade Agreement in 1994. South Korea and Taiwan were helped by their "far neighbour", America, after it nudged towards free elec-

tions the dictators it had long backed. By contrast, Arab countries had no local beacon of democracy to guide them during their recent revolutions—apart from Israel, to whose democratic virtues they seem strangely blind.

In Myanmar the NLD's leaders have signalled that they will not seek retribution: that no one who co-operates with the new order will be carted off to the International Criminal Court in The Hague. That requires astonishing forbearance: among the NLD's leaders are many who were tortured. Others were murdered. But forgiveness is probably wise. It certainly helped in South Africa, where opposition leaders such as Nelson Mandela and Desmond Tutu demanded it of their followers. The Truth and Reconciliation Commission set up in South Africa's new democracy bore witness to past atrocities, but did not prosecute their authors if they confessed.

Forgiveness can thus hasten a transition. But it also carries risks. When members or sympathisers of the old regime are left in place, a "deep state"—a subterranean network of military and intelligence officers, and others—can develop to threaten its successor's long-term health.

Regression analysis

This is what happened in Egypt, Thailand and Russia. When the NLD forms a government in Myanmar next March, it will have to reckon with a well-entrenched army. Miss Suu Kyi—who is, after all, a general's daughter—is likely to be tempted to let sleeping thugs lie. But unless the deep state's power is weakened, democracy may be stillborn. After reunification Germany was rigorous in exposing the Stasi, the East German communist secret police, and removing its agents from positions of power. Purges should not go too far, however. Sacking nearly every Baath party member after Saddam Hussein's overthrow left Iraq without a functioning state.

The sooner the rule of law can be established, the better. Boris Yeltsin's privatisation programme, a rushed attempt to unshackle the Soviet command economy, was hijacked by a tiny group of opportunists, now known as oligarchs. The chaos of the Yeltsin era paved the way for a former KGB hard man, Vladimir Putin. The notion that no one is above the law never took root in Russia.

If new democracies are to flourish, all these concerns must be balanced against a more practical one. According to Terra Lawson-Remer, an expert on transitions at the Brookings Institution, a think-tank in Washington, they need to move quickly "to deliver material improvements to people's lives. Otherwise they stumble; people begin to lose faith." Myanmar—and Tunisia—have a long road ahead. But at least they have examples, not just good intentions, to guide them. ■



One in the eye for dictators



Technology companies

The rise and fall of the unicorns

SAN FRANCISCO

Some private technology firms are having trouble justifying their lofty valuations

WORKERS from technology firms recently gathered at a cinema in downtown San Francisco to watch a preview of "The Big Short", based on the bestselling book by Michael Lewis. The film, which will be released in December, profiles several outsiders who successfully bet against the housing market when everyone else believed it would continue to rise, as it always had. You already know the ending.

Some viewers in the audience must have seen it as a disturbing reminder of how dramatically momentum can shift. Technology companies are unlikely to experience a meltdown as severe as the housing crisis, but an industry that only yesterday was all promise and optimism is showing signs of cooling.

Valuations for private technology firms are rising at a slower clip than they were six months ago. On November 24th Jet, an e-commerce competitor to Amazon, announced that it had raised \$350m (valuing the firm at \$1.5 billion), a big sum for a loss-making startup, but a lower one than it had first hoped for. Recently Airbnb, a fast-growing room-rental firm, raised \$100m, but reportedly stayed at its recent valuation of \$25 billion, instead of rising further. Fred Giuffrida of Horsley Bridge, a firm that invests in private-equity funds, reckons that the valuations in late-stage rounds of financing have declined by around 25% in the past six to eight months. These rounds

are also taking slightly longer to complete.

In the last quarter several mutual funds, including Fidelity, have marked down the value of some of their holdings in unlisted tech firms. Fidelity wrote down Dropbox, a cloud-storage firm, by 20%; Snapchat, a messaging app, by 25%; and Zenefits (software) and MongoDB (databases) by around 50% each. All are "unicorns", that is, tech firms which have yet to come to the stockmarket but are valued at \$1 billion-plus. These are seen as having the brightest of prospects among startups of all kinds. Zenefits, for example, had raised money at a \$4.5 billion valuation in May.

Mutual funds do not comment on the rationale for such markdowns, but it is believed that these unicorns have not met their growth targets. Stockmarket volatility may be another reason: investors value unlisted firms by comparing them with similar listed ones. That can work in private firms' favour at times, but undermines them when stockmarket valuations fall, says Jeremy Philips, a partner at Spark Capital, a venture-capital firm.

It has become clearer that the high valuations firms achieve in private are not always maintained when they go public. This month's listing of Square, a payments company, valued the firm at around \$4 billion, around a third less than in its most recent private round. Other firms have also suffered "down rounds", or devaluations,

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too (see table, next page). An especially poor performer is Etsy, an online marketplace for handmade goods, which is 70% below where its shares traded when it went public in April.

Many investors in unicorns had bet that a new generation of technology firms would unsettle the old guard, but that has not happened as quickly as they had predicted. Tech giants like Amazon, Google and Facebook have continued to grow impressively, especially considering their already large size; and they have been adept at entering new markets that startups might otherwise have claimed. For example, Facebook has bought and built messaging apps that compete with Snapchat, and Dropbox has a rival in Amazon, whose cloud-storage business is large and growing quickly. Compared with most profitless startups, the big firms are not outrageously valued. It may become clearer to investors that they not only overestimated the unicorns but underestimated the incumbent firms' growth prospects.

The mood among some backers of startups has become more cautious. Fewer specialist technology investors are taking part in new financing rounds. General investors such as hedge funds, asset-management firms, oligarchs, princes and sovereign-wealth funds are filling the gap. Fidelity led the most recent round for Jet, which some specialist tech investors see as a lemon of a business, as it bleeds money trying to undercut Amazon. In September Baillie Gifford, a Scottish wealth-management firm few in Silicon Valley have heard of, led a round of funding for Thumbtack, which helps skilled workers find jobs, valuing the startup at \$1.25 billion.

With investors, until recently, throwing money at them, the unicorns have got into the habit of burning through their cash in ➤

► an attempt to buy market share. Lyft, a taxi-hailing firm that is a rival of Uber, reportedly suffered losses of nearly \$30m in the first half of this year, on less than \$50m in revenue. Instacart, a food-delivery firm, is rumoured to lose around \$10 on each order it fulfils. Such practices are only likely to stop when the funding for these firms dries up, or investors whip them into shape.

Another ill-advised but common practice among the unicorns is their habit of pumping up their valuations and giving outsiders a misleading picture of what they are "worth". In an effort to make their supposed valuation go up each time they raise funds—so as to suggest that they are making good progress—many firms are agreeing to investors' demands to attach special privileges to the shares being sold. In theory, if an investor pays \$100m for a 10% stake in a firm, that implies a valuation of \$1 billion; but if the investor attaches conditions to the purchase that guarantee him a return or will give him his money back first, it means the effective valuation being put on the company might no longer really be \$1 billion. An investor might be happy for the company to talk as if it has achieved the \$1 billion valuation as long as he has his extra guarantees.

To participate in late-stage financing rounds, many investors are asking for favourable terms such as "liquidation preferences", in which it is promised that they will get at least their money back and sometimes a guaranteed return on top. In other cases, investors are offered "ratchets", in which they will receive extra shares in compensation if the firm's valuation is reduced when it lists on the stockmarket. Late-stage investors in Square were protected with ratchets, so they are likely to have made a good return even though it went public at a reduced valuation.

The unicorns' employees, whose holdings of common stock are diluted by these protections, are among the main losers from all this. Firms do their employees "a disservice with their high valuations," says James Park, the boss of Fitbit, a maker of fitness-tracking devices that went public in June. "I don't think a lot of people realise

Business in Hong Kong

Standing up to Superman

SHANGHAI

A buy-out by Hong Kong's biggest tycoon is foiled

HONG KONG likes to think of itself as a bastion of global capitalism. Unlike politicised and parochial financial centres on the Chinese mainland, locals claim, their transparent markets protect the rights of minority investors. As evidence, they point to the fact that Hong Kong refused to let Alibaba list on its stock exchange last year, because the Chinese e-commerce giant's management wanted to use a dual-share structure that limited the rights of minority shareholders. That rebuff forced Alibaba to move its \$25 billion listing to New York.

The growing influence of mainland regulators and tycoons in the former British colony makes this boast look implausible at times, but something remarkable happened this week in Hong Kong. Li Ka-shing, a local tycoon nicknamed "Superman" for his business acumen, is in the midst of reorganising

his vast business empire. As part of this effort, Mr Li wants to merge Power Assets Holdings (PAH), a cash-rich energy firm, with Cheung Kong Infrastructure (CKI), a global conglomerate with holdings ranging from transport to waste management. Such a deal would allow CKI, which Mr Li controls, to tap into PAH's cash holdings of \$8.8 billion for acquisitions.

Superman usually gets what he wants, but not this time. On November 24th shareholders rejected his \$12.4 billion proposal to combine the two entities. About half of the other shareholders in PAH voted against the plan. They were emboldened by critical reports issued by Institutional Shareholder Services and Glass Lewis, two firms that advise investors on how to cast their votes, which argued that although Mr Li had sweetened the terms of his offer, it was still too stingy to PAH's other shareholders.

The vote represents a setback for Mr Li, not Kryptonite. His plan to shift the focus of his investments from the Chinese mainland to Europe, Australia and elsewhere will continue. CKI cannot make another bid for PAH for a year; but since the two firms share several directors, other ways may be found (a special dividend, say) for the former to get its hands on the latter's cash. The octogenarian's plan to hand the running of his empire to his elder son, Victor, is unlikely to be affected. Even so, it was a good day for capitalism in Hong Kong.



Thwarted, for now

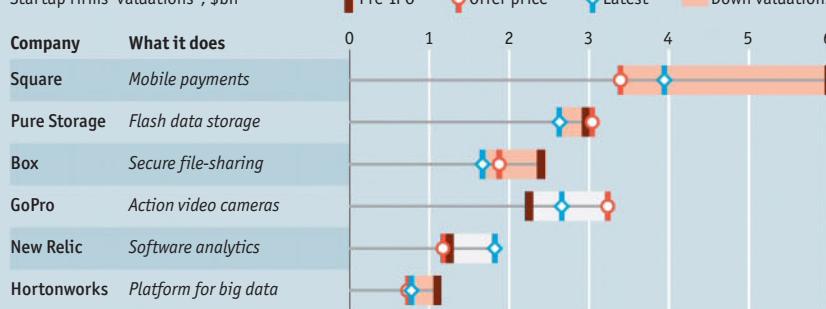
that once preferred stock and liquidation preferences come in, their common stock isn't worth much." He also says private firms are much more "cavalier" in claiming that they will grow to become \$20 billion-30 billion firms. This helps attract employees, but may mislead them.

The tech industry's herd of unicorns contains many beasts that look awfully similar to each other, or to longer-established firms. Yet many are being valued—in as much as the valuations are believable—as if they were guaranteed to be among the long-term winners in their line of business. In fact, not all can survive. Weaker firms have been able to keep going because money has been so easy to raise. And their spendthrift ways have made it harder for stronger rivals to control their own costs and make a decent profit. If investors are now becoming more cautious, that should lead to a healthier climate in the tech industry.

Firms that are still perceived as winners, such as Uber, will not have any trouble raising new money, no matter how severe the contraction in funding. The pain of a slowdown will be felt most by firms that have lots of other tech firms as clients. Food-delivery, catering and taxi-hailing firms get lots of business in San Francisco ➤

Unicorns, snakes and ladders

Startup firms' valuations*, \$bn



Sources: Bloomberg; CB Insights; Dow Jones Venture Source

► and Silicon Valley from tech firms that subsidise meals and rides for their employees. Firms that offer online monitoring tools or recruiting services also depend highly on tech companies for business. So do bigger firms like Twitter and Facebook that have benefited from the boom in tech firms' advertising, says Gil Penchina, an investor, who says he has been trying to avoid exposure to this breed of firm.

In past downturns healthy and well-capitalised firms have benefited, says

Sander Daniels, a founder of Thumbtack, who points out that Google had its "pick of the litter" of top engineers after the dotcom bust over a decade ago. Those firms that loaded up with cash in good time for the downturn will also do well. Airbnb, for example, has around \$2 billion in cash, and a burn rate of around \$100m a year. If the housing boom-and-bust taught any lessons to Silicon Valley, it is that the rich tend to bounce back most quickly. This will be true of the tech industry as well. ■

ferent areas of cutting-edge research, the largest firms are increasingly buying in drugs that are already in the course of development. In some cases they do so by buying other established firms. For example, Pfizer acquired Lipitor, its blockbuster cholesterol-lowering pill, as part of its takeover of Warner-Lambert. Likewise, when Gilead bought Pharmasset, one of the assets it acquired was Sovaldi, a hepatitis-C treatment which is now one of Gilead's biggest sellers.

Increasingly, the drug giants are buying smaller, younger biotechnology firms which focus on a single-treatment approach—such as last year's purchase by Merck, an American firm, of Idenix, which is pursuing a different route to inhibiting the hepatitis C virus from Sovaldi's. Whether the target firm is big or small, buying in promising potential drugs is a good strategy. A study by Bain, a consulting firm, found that in the past 20 years those drug companies that consistently did well in various therapeutic areas were earning more than 70% of their sales from products developed elsewhere.

As the biggest firms have increasingly outsourced the early stages of drug discovery, they have cut back their in-house spending in those areas of research in which they are weak. But they have continued to spend heavily on what are more like beauty products than life-saving cures—think of Allergan's Botox anti-wrinkle jabs, or Latisse, its lotion for thickening eyelashes. They have also continued to pump money into making incremental changes to their existing drugs, so as to claim some small advantage—and big price differential—over rival treatments.

Overall, the new approach seems to be helping to improve the industry's efficiency. Tim Gamble, a consultant at Data Monitor Healthcare, says drugs in development are not failing at the rate they used to. Last year a record number of new medicines gained approval. Rising efficiency may also be the result of the way the study of the human genome is leading to a deeper understanding of diseases. James Bianco of CTI Biopharma, a small drugmaker, argues that the genomics revolution is making it faster and less risky to develop a new treatment approach, thus cutting the cost of basic research, whether at startups or global pharma giants.

But what about the price?

Promising as all this sounds, there is little sign yet of any improvement in the efficiency of drug research translating into cheaper medicines. The shareholders of a drugmaker expect it to charge as much as it can get away with; and since many drugs, for as long as their patent is in force, have no close competitors, the health systems and insurers they sell to may have little choice but to pay whatever they are asked ►



Drug companies and research

Billion-dollar babies

The high cost of R&D is used to explain why drug giants merge, and why they must charge high prices. The reality is somewhat different

AS THEY announced the proposed merger of Pfizer and Allergan to create the world's biggest drugmaker, on November 23rd, the two firms' bosses stressed the scale that is needed to keep inventing blockbuster treatments. As Ian Read, Pfizer's boss, put it, the merger will create "a leading global pharmaceutical company with the strength to research, discover and deliver more medicines and therapies to more people around the world."

A more convincing explanation for the deal is that, by shifting Pfizer's tax domicile from America to Ireland, where Allergan is domiciled, the combined group's tax rate will fall from about 25% to 17-18%. But even leaving that aside, the common suggestion that size is needed to create a research-driven powerhouse does not stack up. The figure of \$2.6 billion cited by PhRMA, the American drugmakers' lobby, for the cost of developing a new drug, is questionable. And the industry is in any case moving away from a model in which giant firms throw huge sums at in-house research in a

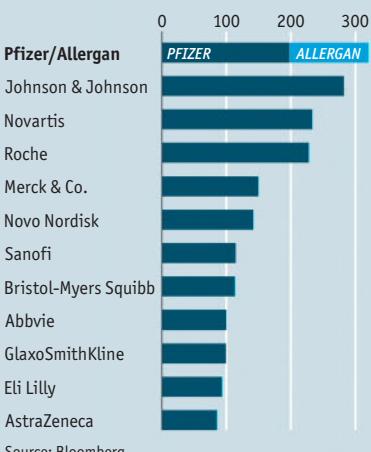
quest for ground-breaking new treatments.

Start with the \$2.6 billion figure. Two years ago, when the number being bandied about was just \$1 billion, even the boss of GSK, one of Pfizer's biggest rivals, described it as a myth. Médecins Sans Frontières, a charity, claims that new drugs can be developed for as little as \$50m and no more than \$190m, even taking into account the cost of those that fail during clinical trials. Some of the assumptions used to arrive at the \$2.6 billion figure are easy to pick apart. One example is the padded estimate for the drug firms' cost of capital. But at least as important is that the figure is based on data from between 1995 and 2007. It says more about the failures and inefficiencies of the drug giants' in-house laboratories back then than it does about how much it should cost to bring a new treatment to market now. That matters because the industry has been moving towards a new model.

The main element of this model is that, rather than spending heavily in many dif-

The monster in the lab

Pharmaceutical companies' market capitalisation
November 25th 2015, \$bn



► for. Sometimes a drug's new owner makes more from it than the old owner, simply by being more demanding on price. Pharmasset had been thinking of selling Sovaldi at between \$36,000 and \$72,000 for a course of treatment. But Gilead, having bid highly to win control of Pharmasset, put the drug on the market for \$84,000.

Some drug firms are also buying makers of long-established, out-of-patent treatments, realising that even these could bear higher prices if no other firm is supplying a "generic" copy of them. Turing Pharmaceuticals and Valeant have become notorious for buying the rights to some such medicines, and jacking up their prices.

Ensuring that the benefits of greater research efficiency are fully passed on to governments and health insurers would require drastic changes, such as, say, abolishing the patent system and finding some other way to incentivise basic research. Among the more imaginative ideas in this vein, the open-source pharmaceuticals movement is experimenting with using prizes as an incentive for teams of volunteer scientists to work on new treatment approaches. Once invented and tested, the drugs would be free for any firm to make.

Realistically, though, the chances that new approaches to research will dramatically cut the cost of medicines look slender. That leaves more administrative approaches. It could be made easier to import cheap copies of unpatented drugs made in other countries. Buyers of medicines could share more information about the different prices they are being charged for the same pills. They might be firmer in refusing to pay over the odds for new treatments that offer marginal gains. Medicare, America's health system for the elderly, could be allowed to try to negotiate with the drugmakers, something it is banned from doing now. If the producers are becoming more efficient, the buyers should respond. ■

Private space flight

Reusable rockets

Jeff Bezos's Blue Origin brings space tourism a step closer to reality

SOMETIMES the dark horses are the ones to watch. On November 23rd Blue Origin, a publicity-shy rocketry firm owned by Jeff Bezos, the founder of Amazon, announced that it had achieved something spectacular. Not only did its *New Shepard* craft make it safely back to Earth after a brief sojourn in space—so, too, did the BE-3 rocket booster that launched *New Shepard*. After separating from the spacecraft, the rocket fell back to Earth. At around 1.5km from the ground, it reignited its engines, slowing its fall and making a controlled, gentle landing (pictured). To quote the firm's triumphant press release: "Now safely tucked away at our launch site in West Texas is the rarest of beasts, a used rocket."

At the moment, space rockets are one-shot machines. After boosting their payload to the required speed and altitude, they fall back to Earth—often breaking up in the atmosphere on the way. That is one reason why space flight is so eye-wateringly expensive. It is a bit like blowing up your car after every trip and having to buy a new one. Rocket scientists have been trying to make their rockets reusable for decades. The closest they have come, until now, was the Space Shuttle. But even this (besides being far more expensive than an ordinary rocket) was only partly reusable, with the giant external fuel tank being discarded after each launch.

Blue Origin's machine is thus a technical triumph. Unlike the Shuttle's solid-fuelled boosters, which relied on parachutes to splash down into the ocean (whence they had to be recovered by America's navy), Blue Origin's machine landed itself like the rockets of science fiction, by firing its engines and balancing on its exhaust until it had safely touched down.

The BE-3's flight is a publicity coup. SpaceX, a more established (and less camera-shy) rocketry firm founded by Elon Musk, another internet billionaire, has also been working on reusable rockets. The most recent versions of its Falcon machines are designed to land themselves on uncrewed ocean-going platforms. SpaceX has come close to pulling that off several times, but so far all its efforts have failed; the most recent attempt, in April, ended in a fireball. Now Mr Bezos's firm has beaten Mr Musk's to the punch.

Of course, this comparison is not quite fair. Blue Origin's focus, at least for

now, is on space tourism. The idea is to take a handful of paying customers on a joyride to the edge of space, rather than to heave things all the way into orbit, as SpaceX's rockets are designed to do—a task for which much higher speed is required. The *New Shepard* squeaked into space on a technicality. Its maximum altitude on this flight was 100.5km, a hair's breadth above the 100km that (arbitrarily) is held to be where space begins.

Blue Origin's competitor in that market is not SpaceX, but Virgin Galactic, another orbital-tourism firm, which suffered a serious setback last year when one of its spaceships crashed on a test flight, killing one of its two pilots. SpaceX, in contrast, is already flying all the way into orbit, and is doing so for real money. Its craft both deliver supplies to the International Space Station and launch satellites for paying customers.

None of this, though, detracts from Blue Origin's achievement. Mr Musk has estimated that reusable rockets could cut the cost of a space launch by an order of magnitude or more. Flying rockets is notoriously difficult, and flying them backwards is even harder. But Blue Origin has made it look easy.



Safely home



Corporate culture in South Korea

Loosening their ties

SEOUL

A punishing work culture is gradually being relaxed

MEETINGS to last no more than 30 minutes; junior staff allowed to speak freely with superiors; a cut in bonuses for bosses whose teams do not take enough holidays. Since 2012 “Pride”, a handbook, has set a new tone for the internal culture of Hyundai Capital. Departments whose staff work latest into the evening are listed on the firm’s intranet: not to hold them up as models of hard work, but to tell them off for not working efficiently enough.

It is a striking departure from the norm for the consumer-finance arm of one of South Korea’s most culturally conservative *chaebol*, the country’s giant family-owned conglomerates. Established during Japanese rule of the peninsula (1910–45), most of the *chaebol* were fashioned in the working style of Japan’s pre-war zaibatsu, huge industrial companies; many *chaebol* founders were also educated in Japan, and their successors still have connections there. Lifetime employment, hierarchical management and pay based on seniority rather than performance all struck a chord with Korean Confucianist traditions.

Confucianism’s philosophy, based on the importance of the family, continues to hold sway in South Korean business; companies strive to create a sense of brotherhood and belonging. Bosses are treated as father figures, and colleagues like siblings, joining in each other’s family events. In return employees are expected to put in long hours at their desks—more than in any other OECD country, bar Mexico. To leave the office before higher-ups is seen as a betray-

al. Late-night drinking sessions with bosses are de rigueur.

Employee loyalty and centralised decision-making served the *chaebol* well from the 1960s on, as they led the South’s rapid industrialisation after a devastating war that cemented the Korean peninsula’s division. Military discipline seeped into businesses. Even now, the immersion courses new *chaebol* employees undergo—typically two intense weeks of learning and bonding in a company complex in the countryside—are not unlike the boot camps that South Korean men endure at the start of their two-year military service. Recruits are drilled in the firm’s history and principles; they also get little sleep, in preparation, says a Samsung newbie, for a gruelling tempo of work. Some firms require trainees to run a marathon on each week of the course: the only condition is that they all arrive back at their dorms together.

Yet companies are realising that their continued success, at home and abroad, requires an overhaul of the working culture that made them so big in the first place. At home, the changing expectations of younger workers—who are increasingly educated abroad, and less willing to sacrifice their home life for their corporate family—are forcing companies to rethink how to recruit. They are also grappling with how to manage their foreign operations: send out Koreans to run them, or put locals in charge? If the latter, should they try to impose Korean corporate ways on them?

Piecemeal change has been under way

for decades. Samsung introduced a merit-based pay structure as early as 1997. Then, only 2% of South Korean firms adjusted an employee’s annual reward based on his performance; within a decade, 48% were doing so. In 2006 SK, a telecoms company, ditched its elaborate hierarchy of job titles and started calling most staff just “manager”. In 2013 KEPCO, a state-run utility, declared it was discarding 14 “authoritarian remnants” among its working practices (chosen after an open consultation). All employees must now make their own coffee; forced after-hours drinking is banned; and the “managers only” lift has gone.

Few were as bold as LG Electronics in its efforts to open up. In 2007 it appointed Yong Nam, a reformer, as its chief executive. Mr Nam hired non-Koreans for senior positions and made English the company’s working language. According to Eric Surdej, the first non-Korean to join its upper management, Mr Nam’s biggest obstacle was winning the support of other LG executives. They were suspicious of his Westernising moves, and “liquidated” him in 2010 when the firm fell behind in smartphones. He was replaced by the founder’s grandson, and within 48 hours, 25 of the 27 non-Korean directors had been fired.

Mr Surdej wrote a book about his experiences at LG, “Ils sont fous ces Coréens” (“These Koreans are Crazy”), describing 14-hour working days, the “quasi-religious” obeisance to bosses, and South Korean colleagues anxious to answer the phone on its first ring to impress their chiefs. Another obsession of the companies’ bosses is keeping up with, or preferably getting ahead of, their old colonial masters. Mr Surdej says his South Korean colleagues suspected that their Japanese counterparts had “opened themselves so much to the West that they had forgotten their own DNA”—and blamed this for corporate Japan’s slow decline.

If LG hoped it might recover lost ground by reverting to traditional ways, it has been disappointed. It has continued to struggle and lags well behind Samsung, its more globally-minded domestic rival. Some other firms have not paid attention to this parable, however. Don Southerton, who advises South Korean businesses on how to manage their foreign operations, says many have been “going back to basics” since the slowdown in China and other big emerging markets. Their Korean staff have reverted to working longer hours and straining to hit short-term targets, under pressure from the bosses back in Seoul.

More South Korean companies appear to be tightening the screws at home, too: a survey of more than 1,000 employees conducted in June by Job Korea, the country’s biggest online job portal, found that almost half felt their company was disciplining them more than before: making them stick to a strict lunch hour, for example; or ➤

▶ asking them to arrive at the office an hour earlier; or in stricter dress codes.

Relapsing back into old ways is unlikely to work, however, given the reluctance of younger employees to tolerate the strictures of the typical South Korean workplace. Their expectations are "totally different" from those of their parents, says Yongsun Paik, an expert on Korean management culture based in America. Now that many firms have stopped paying people according to time served, those who switch employers to escape an oppressive workplace or to try out something new are no longer penalised. As a result, South Koreans are now much more likely to move jobs than their Japanese peers.

Many young workers are still handicapped by not having gone to one of the country's top three universities, whose old-boy networks reach the top ranks of the *chaebol*. Recruiters shortlisting candidates award far higher scores to applicants from those institutions, says an executive who has worked at Samsung, LG and Hyundai. But some firms are now wondering if this prejudice is denying them the brightest and best. If Steve Jobs (a college drop-out) applied to work at a Korean company, would we have accepted him? asks Eugene Chung, who works in human resources at Hyundai Capital. "No."

"Misaeng", a recent South Korean television drama, follows the trials and triumphs of a young employee without a university degree as he climbs the corporate ladder of a typical conglomerate. In one episode his boss scorns his protest that he is doing his best: that may be a good enough excuse at school, but "Here, at work, you just bring the results." The buzz it generated among young South Koreans suggests more are thinking about the sort of culture they want to work in.

Last year Ms Chung's team set up a special track for candidates who lacked a university degree but who could demonstrate other exceptional qualifications. It has also started a "job fair" in which each department erects a booth and seeks to interest potential recruits—a reversal of the usual *chaebol* practice of hiring people and then telling them which area they will be working in. Samsung has overhauled the Samsung Aptitude Test, an exam for job applicants covering language, maths, reasoning skills, general knowledge and spatial skills. From this year essays, interviews and hands-on experience are part of the mix.

Such experimentation is necessary. In 2018 South Korea's working-age population will begin to decline. Its firms will increasingly have to compete for workers, and thus need to rethink their biases against women, foreigners and those with an unconventional education. The country's traditional work culture helped power it to prosperity. Now it must change to attract the talent it needs. ■

Fashion retailing

Chicago hope

CHICAGO

Uniqlo is struggling in the world's biggest clothing market

WHEN a globally successful fashion-store chain opens up for the first time in a big city's most prominent shopping district, it might reasonably expect a rush of excited consumers. But when Uniqlo of Japan opened its first midwestern outlet last month, on Chicago's Magnificent Mile, the reaction was restrained. In its first week of trading, "Some days were busy, others not so much," says a saleswoman. Many who did turn up were from out of town, she reckons.

Uniqlo did its best to arrive in Chicago with a splash. It took over an "El" (elevated light-rail) train, decorated it with Japanese lanterns and brought over a DJ to pump out Japanese pop as the train travelled round the Loop, the central business district. Chicagoan chefs, cheerleaders, rappers and other "tastemakers" were hired to model Uniqlo's clothes on its website.

The retailer is performing well at home in Japan, thriving in China, South Korea and Taiwan, and doing not so badly in Europe (though it did close some of its British branches). But America, where it has more than 40 shops, is a different story. Uniqlo has been in the country for ten years, but its presence is still much smaller than that of its main global rivals, Zara and H&M, respectively a Spanish and a Swedish retailer of fast fashion. It is also smaller than two local casual-clothing chains, Gap and Forever 21, and than "off-price" sellers of de-



That's a dummy, not a customer

signer labels such as Ross and T.J. Maxx. Last month Fast Retailing, Uniqlo's owner, reported losses for the fourth fiscal quarter, mainly because of the dismal performance of its outlets in America and of J Brand, its ailing American denim chain.

Succeeding in America's fiercely competitive retail market is never easy, for local and foreign firms alike. American Apparel declared bankruptcy in October. Gap is closing a quarter of its 675 shops in the country. J. Crew, an American brand that Fast Retailing considered buying last year, is reporting slumping sales. Abercrombie & Fitch, until recently a rising star, has been struggling. Among the foreign retailers, Mango, of Spain, is shutting all its 450 concession outlets in J.C. Penney department stores in America. United Colours of Benetton, an Italian retailer, shut its last American shop in September. (In the same month Primark, a super-cheap Irish retailer, opened its first American shop in Boston: if it proves as successful as it has elsewhere, it could make life even more brutal for the established chains.)

Uniqlo has already scaled back its American ambitions. Though Tadashi Yanai, the chief executive of Fast Retailing, had previously said he wants to open 200 Uniqlo shops in America by 2020, the firm now says it will open only five in the coming fiscal year, compared with 17 in the one just ended.

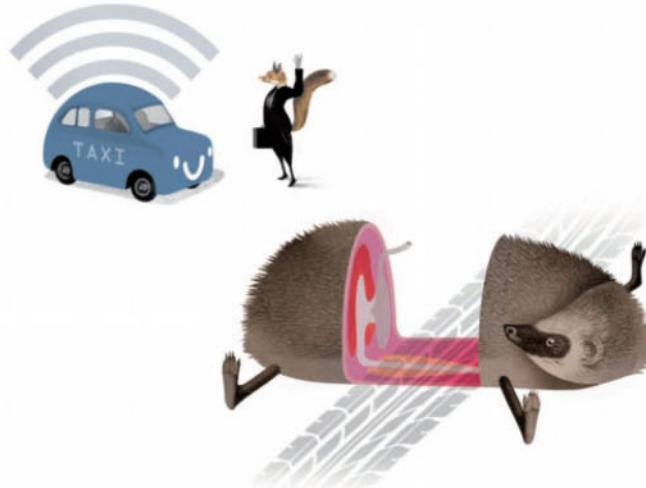
Uniqlo's weakest branches are in suburban American shopping centres, says Masafumi Shoda at Nomura Securities, an investment bank. In the 'burbs, no one has heard of the company. Mr Shoda expects it to close some such branches (three in New Jersey have already gone) and concentrate on city-centre stores like the new Chicago one, and on selling online. So far only 15% of Uniqlo's sales in America are through the internet.

Takahiro Kazahaya, an analyst at Deutsche Bank, argues that Uniqlo should persevere in America because winning brand recognition takes time. It is doing so well in Asia, he says, that it can afford to bear losses in America for a while. Moreover, if Uniqlo is to become the world's top fashion brand, as Mr Yanai often says he wants, it can hardly abandon the world's biggest clothing market.

But Toby Williams of Macquarie, another bank, thinks that for all Mr Yanai's rhetoric, he may be satisfied with simply establishing a stable foothold in America, rather than seeking to conquer it at all costs. By positioning its brand in the American cities most visited by Chinese and other Asian shoppers, Uniqlo will bolster its image among them as a global fashion success. It would be worth bearing some modest losses to maintain a few showcase branches in America, Mr Williams says, to impress consumers from Asia, where most of its growth opportunities still lie. ■

Schumpeter | Disrupting Mr Disrupter

Clay Christensen should not be given the last word on disruptive innovation



TWENTY years ago a then obscure academic at Harvard Business School published a career-making article in the *Harvard Business Review* (HBR), warning established companies that they were in grave danger from being disrupted. Today Clay Christensen is an established company in his own right. He is regularly named as the world's most influential management guru (his Harvard colleagues affectionately call him Mr Disrupter). He has applied his theory to an ever-wider range of subjects with books such as "Disrupting Class" (on education) and "The Innovator's Prescription" (on health). He even has his own consulting operation to help him stretch his brand. Businesspeople everywhere treat him as a guide on how to cope with change. But the risk is that by paying too much attention to his theory, they will miss other disruptive threats.

This thought is provoked by a new HBR article on the subject, written by Mr Christensen along with Michael Raynor and Rory McDonald. Mr Christensen rightly points out that the word "disruption" is now bandied about so much that it is losing all meaning. The number of newspaper and journal articles using the phrases "disruptive innovation" or "disruptive technology" has gone from practically zero when Mr Christensen coined them to more than 2,000 in 2014. However, he goes too far in arguing that Uber, a taxi-hailing service, is not "genuinely disruptive" because it does not fit his theory of how disrupters break into established markets. Mr Christensen does not have a monopoly on the word disruption, nor a patent on his "disruption theory": Joseph Schumpeter, for example, produced a rather compelling theory of "creative destruction" long before Mr Christensen was born.

The problem with Mr Christensen's argument is not that it is empty. Unlike so much of the output of other management writers, his big idea contains genuine insights. Mr Christensen argues that incumbent companies can fail despite being well run and serving their existing customers as assiduously as possible. Their success can blind them to the realisation that scrappy outsiders are quietly rewriting the rules. These upstarts, he says, begin by using unproven or inferior technologies and business models to offer a cheap alternative to mainstream products and services. That wins customers whom established firms regard as unprofitable or unreachable. Little by little, the newcomers get better, and

eventually they are in a position to raid the incumbents' customer base. This leaves established firms in a dilemma: whether to keep investing in their current business—which is proven but now vulnerable—or take a leap into the unknown and emulate the disrupters, so as not to be wiped out by them.

Critics have picked holes in the case studies that Mr Christensen has used to illustrate his theory. In June last year Jill Lepore, a colleague at Harvard University, caused a stir with a takedown in the *New Yorker* magazine. In September Andrew King and Baljir Baatartogtokh published a more sober article in the *MIT Sloan Management Review*, arguing that "the majority" of Mr Christensen's 77 case studies did not fully fit his theory.

However, even if he stretches some examples Mr Christensen has clearly identified something big. The problem is more that the definition of disruption he seeks to impose is too narrow. He rules out Uber because, from the start, it offered a better level of service than existing taxi firms, rather than something cheap but inferior. But ask any cabbie if it threatens to disrupt his business, and you will be left in no doubt of the answer. As Isaiah Berlin, a philosopher, would have put it, Mr Christensen is a hedgehog (someone who knows one big thing) rather than a fox (who knows lots of little things): his hedgehog mind leads him to ignore or belittle companies or market forces that do not fit his template.

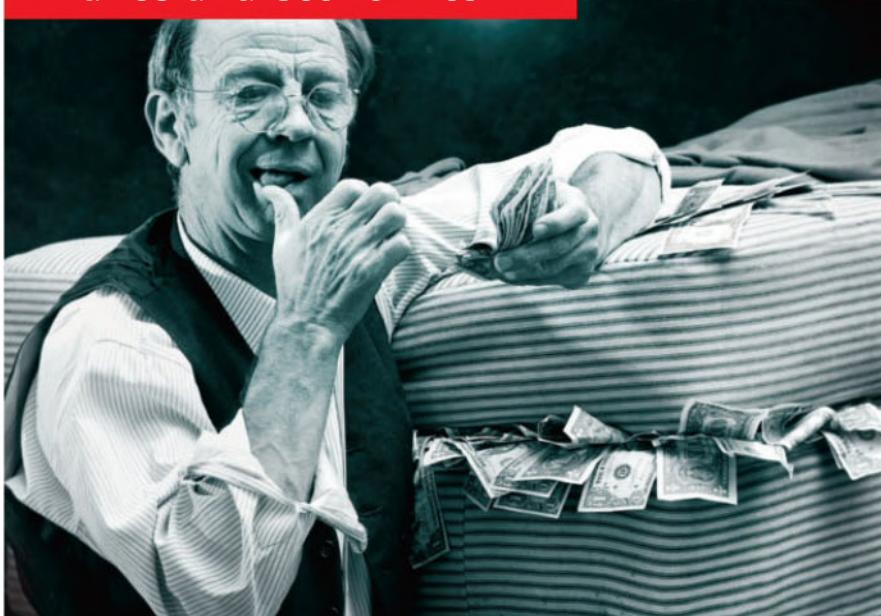
In Mr Christensen's theory, disruptive innovators are generally newcomers. But perhaps the most successful disrupter of recent years is an established firm—Apple—that has applied its mastery of technology and design to ever more areas. Mr Christensen greeted the arrival of the iPhone with a shrug: this was a "sustaining" rather than a disruptive innovation, with "limited" chances of success. He failed to see that Apple was reinventing an entire category of product, by turning the mobile phone into an all-purpose computer, entertainment system and shopping centre.

Mr Christensen argues that "real" disruptive innovators succeed by attacking from the low end of the market. But Apple has invariably succeeded by aiming at the top end. Likewise, Netflix destroyed Blockbuster by attracting its core customers: people who were so enthusiastic about watching films that they would pay a monthly subscription to consume them in bulk. Both Netflix and Uber have prospered by dealing with the "pain points" of core customers: in Netflix's case, Blockbuster's limited range and punishing late-return fees; and in Uber's case, the manifold inefficiencies of the established taxi industry.

Don't just follow the feet of Clay

It would be going too far to predict that Christensen Inc will itself be disrupted out of existence: there are plenty of businesses ripe for his variety of innovation (not least his own, higher education). But he should be treated as one voice among many. There are types of disruptive innovation other than the one he champions. Insurgents can revolutionise old industries by using new technologies, but established companies can use their superior war chests and management skills to invade adjacent industries.

Indeed, there are good reasons for thinking that this second kind of disruptive innovation may be more important than Mr Christensen's: think of the threat that Google poses to carmakers, Facebook to newspapers and Apple to television stations. Back in 1995 Mr Christensen struck fear into executives by warning them that they could be put out of their jobs by companies they had never heard of. Today the biggest threats may come from people they talk about every day. ■



Negative interest rates

Bankers v mattresses

Central banks are still testing the limits to how low interest rates can go

IN JUNE of last year the European Central Bank reduced its benchmark interest rate, at which it lends to commercial banks, to 0.15% and its deposit rate, which it pays to banks on their reserves, to -0.1%. For a central bank that was once cautious about unconventional measures, setting a negative interest rate was a bold move. The ECB was in effect charging commercial banks to hold their excess deposits at the central bank, in the hope that this would drive down borrowing costs more generally.

Three months later, the ECB cut the deposit rate again, to -0.2%. When the ECB's rate-setting council next meets, on December 3rd, it is widely expected to trim the deposit rate even further, as well as to approve more "quantitative easing" or QE (the creation of money to buy bonds). In a recent speech Mr Draghi claimed that the ECB's unconventional policies over the past 18 months had been the "dominant force" in spurring the euro-zone economy and staving off deflation. Lending by banks is slowly reviving. Even so, he suggested, deficient inflation and lingering concerns about the strength of recovery justify further action.

Not so long ago, the lowest possible interest rate was thought to be zero. There is a ready alternative to keeping money in banks: holding it as cash. Mattresses do not charge for storing notes. Depositors might tolerate small fees, to avoid the cost and hassle of making other arrangements—but

most had assumed their tolerance would be limited. "We are now at the lower bound," Mario Draghi, the ECB's boss, said after the last cut. He now seems to be reconsidering—but how low can the ECB go?

The ECB is not alone in testing the lower bound to interest rates. Denmark's central bank has set its main policy rate below zero for much of the past three years to repel capital inflows that had threatened its exchange-rate peg with the euro. In January the Swiss National Bank abandoned its at-

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tempts to stop the franc from appreciating against the euro by printing and selling francs in vast quantities; instead it resorted to negative interest rates to deter investors from buying francs. Sweden's central bank, the Riksbank, took its main policy rate negative in February, to weaken the krona, make imports more expensive and thus push inflation closer to its target of 2%.

For all these countries, it is the exchange rate against the euro that matters most. To suppress their currencies, their central banks must offer interest rates that are further below zero than the ECB's. The deposit rate in Denmark and in Switzerland is -0.75%. In Sweden it is -1.1%.

This has not caused commercial banks to swap their reserves at the central bank for cash, as theory would suggest. That is because to do so would itself be costly. To settle payments, banks must move vast sums between themselves each day. The costs of counting, storing, moving and insuring lorry-loads of banknotes apparently trumps the smallish charge Europe's central banks are levying to hold electronic deposits. The other possible use for banks' reserves is to lend them to other banks, but they are already awash with the excess liquidity created by QE.

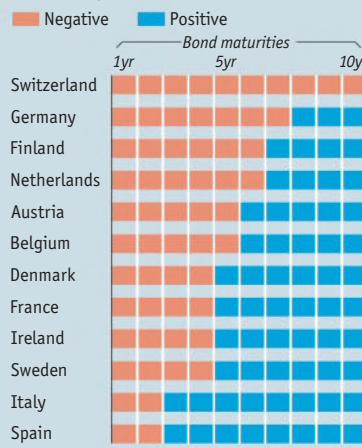
The deposit rate at central banks sets a floor for the cost of overnight loans more generally, which is why short-term money-market rates have also turned negative. Indeed, negative policy rates and money creation through central-bank purchases of bonds or foreign currencies have dragged the yields on sovereign bonds into the red all over Europe (see chart). That in turn has pulled down the interest rates charged by banks for new loans.

Banks have passed on some of the cost of negative rates to their corporate clients. For them, too, the cost of moving and storing large stocks of cash is prohibitive; the ➤

Money for nothing

Government-bond yields

Selected European countries, November 25th 2015



► obvious alternative—buying safe and liquid bonds—also now comes at a cost, thanks to negative yields.

This week Alternative Bank Schweiz, a tiny Swiss outfit, said it would be forced to levy negative rates on personal accounts from January. Most banks, however, have shielded retail customers from such charges, on the assumption they would move their accounts elsewhere. As a consequence, overall bank deposits have been stable. The banks have simply absorbed the cost of deposits at the central bank, which has dented profits. A further cut in the ECB's deposit rate of 0.2 percentage

points could squeeze the net profits of European banks by 6%, according to Autonomous Research.

As interest rates creep further into the red, economists' prescriptions have become bolder. In a speech in September Andy Haldane, the chief economist of the Bank of England, outlined a range of options to allow rates to go lower still. The most radical would be to get rid of the matress option by abolishing cash altogether. Ken Rogoff of Harvard University calculates that there is \$4,000 of currency in circulation for every person in America. Much of it is used to hide transactions from

tax authorities or the police. Abolishing it would curb such activities, as well as helping central bankers.

Yet depositors might still find ways to safeguard their savings. Switching to foreign currency or precious metals would be an obvious option. As Kenneth Garbade and Jamie McAndrews of the Federal Reserve Bank of New York point out, taxpay-ers could make advance payments to the taxman and subsequently claim them back. Depositors could withdraw funds in the form of bankers' drafts (certified cheques) to use as a store of value. Such drafts might even become a form of paral-

Buttonwood | Not so smart

Why two big banks failed

IN 2008, as the financial system was collapsing, Alan Greenspan, the former chairman of the Federal Reserve and champion of free markets, admitted he had been wrong. "I made a mistake in presuming that the self-interests of organisations, specifically banks and others, were such that they were best capable of protecting their own shareholders and their equity in the firms," he said. In other words: why would bankers destroy their own livelihoods?

Some clues to Mr Greenspan's conundrum can be found in a new book* on Lehman Brothers, the American investment bank whose failure precipitated the worst of the crisis, and a recent report** on the collapse of HBOS, a British retail bank, that imploded soon after. Although the two banks had different histories, they made similar mistakes.

For a start, both strayed from their core expertise. HBOS was created through the combination of Halifax, a retail mortgage lender, and Bank of Scotland, one of Scotland's two biggest banks. The merged entity wanted to gain market share in England and compete with the likes of HSBC and Barclays. The easiest way to increase business was to focus on smaller, riskier borrowers. The new lending book grew by 50% in 2007, just as the market was beginning to turn.

Lehman was best known for bond-trading, but moved heavily into property lending. Through a subsidiary called BNC Mortgage it was the 11th-biggest subprime lender in America; it underwrote more mortgage-backed securities than any other Wall Street firm and it made direct investments in property companies.

Managers of both firms thought they were taking advantage of profitable opportunities. By taking even more risk, even as others were retreating, they were



gaining market share. They believed this would bring success in the long term. HBOS thought that retreating from lending in 2007 would damage its franchise. In essence, the pair thought they could survive only by moving forward, like sharks.

Risk-control systems should have saved managers from their mistakes, but didn't. Lehman had a risk department that employed nearly 400 people, including former regulators; its approach to risk management had been praised by the Securities and Exchange Commission (SEC), an American regulator, in 2005. But the chief risk officer was overruled and risk limits were ignored; some investments in commercial property and private equity were excluded from internal stress tests.

HBOS conducted its own stress tests on its property portfolio, but used a hypothetical downturn milder than the recession of the early 1990s. A stress test conducted by external consultants in 2005 calculated that the bank would lose the equivalent of three years' profits only once every 5,000 years; three years later, the bank needed a government rescue.

Both banks became heavily dependent

on short-term funding in the wholesale markets, and thus vulnerable to any loss of investor confidence. That may explain why both banks were slow to write down the value of their assets: any admission of weakness could damage their reputation. And while both banks raised equity in their dying months, neither raised enough.

In neither case did the board control the managers. More than two-thirds of Lehman's board had no significant recent experience of banking. The report on HBOS said its board lacked "knowledge and experience of banking". To be fair, recruitment of experienced non-executives might have been difficult; anyone capable of overseeing a modern bank was presumably working for a competitor.

That points to a broader problem. Lehman had over 7,000 legal entities, of which 209 were registered subsidiaries; it had assets of \$700 billion. Such a complex organisation was very hard to monitor, let alone control.

A long period of benign economic conditions and rising property values lulled executives at both HBOS and Lehman into a false sense of security. They thought they were brilliant and could handle the cycle; in fact, they had just been lucky. To go back to Mr Greenspan's error, bankers did focus on their self-interest: they believed that if they didn't expand their balance-sheets and keep pushing up profits, they would be replaced. They didn't see the truck coming until it hit them.

*"Lehman Brothers: A Crisis of Value" by Oonagh McDonald, Manchester University Press

**"The Failure of HBOS plc"

<http://www.bankofengland.co.uk/pru/Documents/publications/reports/hbos.pdf>

►el currency, since they are transferable. Any form of pre-paid card, such as urban-transport passes, gift vouchers or mobile-phone SIMs could double up as zero-yielding assets. If interest rates became deeply negative, it would turn business conventions upside down. Companies would seek to make payments quickly and receive them slowly. Their inventories would grow fatter.

In practice, euro-zone banks are the ones on the front-line of negative rates. That is sparking worries that, if rates go too low, they might harm the economy. Banks that are nervous about the stability of their deposits are less likely to lend, says Huw van Steenis of Morgan Stanley, an investment bank. Yet pushing rates lower still is also likely further to weaken the euro against the dollar, especially as the Federal Reserve seems set to raise its main interest rate on December 16th. That may even be the ECB's main motive—just as suppressing their currencies is the explicit aim of the other members of the negative-rate club. ■

China's bond market

Pricing risk

SHANGHAI

Debt issuance booms despite a wave of defaults

CHINA'S domestic bond market has never been riskier. It was only last year that it suffered its first default. This year at least six companies have defaulted. The miscreants are a diverse lot, including a beverage bottler, a solar-panel maker and a cement company. As economic growth grinds lower, defaults will inevitably rise.

A gloomy outlook of this kind would normally lead investors to demand a premium before buying bonds. Instead, they have lapped them up, making it cheaper for China's companies to borrow. Bond issuance has boomed this year, reaching almost 12 trillion yuan (\$1.9 trillion) so far, up

Misplaced confidence



from the record 7.7 trillion sold in all of 2014, according to Wind Information, a data provider. This has prompted warnings that, much like the stockmarket earlier this year, China's bond market is swelling into a bubble.

Banks accounted for almost all lending in China until a decade ago. Today, for every five yuan of loans companies take out, they also finance themselves with one yuan of bonds. That has made China the world's third-biggest bond market, behind America and Japan—a development that should help shield the economy from the expensive busts to which banks are prone.

At the moment, though, the bond market seems to be stoking risk. For most of the past five years, yields on highly rated corporate bonds were two or three percentage points higher than on government bonds of the same maturity. This year the spread has narrowed, hitting a low in early November of just 1.3 percentage points (see chart). This implies that investors think corporate bonds have become less risky, despite the proliferation of defaults.

Look at individual bonds, and signs of excess are even more obvious. Vanke is China's biggest listed property developer and, by most accounts, a well-managed company. But the Chinese property business is going through a painful retrenchment after years of overbuilding, which suggests Vanke's bonds are not without their risks. Yet in late September they were treated as just as safe as official issuers. Vanke sold five-year bonds at a yield of 3.5%, the same as the bonds of some provincial governments at the time.

Despite these ominous portents, many Chinese bond analysts take a sanguine view. The increase in issuance has been exaggerated by a debt swap: local governments are on track this year to replace about 3 trillion yuan of expensive loans with cheaper bonds. The average interest rate paid on outstanding debt in China has fallen from nearly 7% last year to just over 6% this year, according to Hua Chuang Securities, making it easier for borrowers to keep up with payments.

Besides, with growth sluggish, the central bank will probably keep interest rates low. Shi Lei, head of fixed-income research at Ping An Securities, expects yields to come down by as much as half a percentage point over the next year. Spreads between interest rates on corporate bonds and government ones are also starting to widen again. Their compression had been spurred by the stockmarket crash in July, when much of the money that fled stocks ended up in bonds of all ratings. Chen Kang of SWS Research believes that now the stockmarket has rebounded, investors are starting to differentiate again between private and government-backed issuers.

Whether those government-backed issuers deserve their low yields is another

question. The handful of defaults to date shows that China is willing to let some companies fail, but so far no big firms in which the central government retains a sizeable shareholding have met that fate. Instead, those that have got into trouble have been rescued, leading investors to treat their bonds as virtually risk-free. Sino-Steel, a struggling miner and steel trader, is the latest test of this implicit guarantee. It had been due to repay bondholders some 2 billion yuan in October, but pushed the date back to December 16th. A default would shake investors' faith in government-backed bonds—bringing some sobriety to a market that sorely needs it. ■

Italy's bad debts

Burden-sharing

MILAN

The government tries to relieve banks of non-performing loans

BANKS in Italy fared better during the financial crisis than many of their peers, sparing Italian taxpayers the bail-outs their counterparts in other countries had to shoulder. But although they stuck to their cautious business models and avoided fuelling a big housing boom and bust, Italy's protracted recession has enfeebled them. It has caused bad loans to soar, which in turn has prevented them from supporting a still weak recovery with new lending.

The burden of non-performing loans (NPLs) in Italy is now immense: they amount to €350 billion (\$370 billion), the equivalent of 21% of GDP. With these unproductive assets tying up their capital, Italian banks are unable to extend new credit to businesses. In fact, they are lending out less in an effort to shore up their balance-sheets (see chart).

The government would like to fix all this by setting up a "bad bank"—an asset-management company that would strip

Dead weight

Italian banks

Lending to
non-financial firms
% change on a year earlier

Non-performing
loans
% of total



► bad loans off the banks' books and thus enable them to resume normal service to businesses. Schemes of this sort recently helped Ireland and Spain overcome big banking crises. BCG, a consultancy that has worked with the Bank of Italy on the issue, reckons that paring the most intractable NPLs to the level of 2009 would boost GDP by 1.5-2 percentage points over three years. Given the weakness of Italy's recovery, that would be a huge leg-up.

However, such a gain would not come cheap. That was highlighted this week by the central bank's decision to wind up four lenders whose total assets were only €47 billion. Even though these were small outfits, the cost of the rescue came to €3.6 billion. That will be used to cover losses and to recapitalise the new "bridge banks" into which the deposits and good loans will be transferred. Around a third of the sum will come from "bailing in" shareholders and junior creditors; a newly created "resolution fund", financed by contributions from other Italian banks, will provide the rest. Intesa and UniCredit, Italy's two biggest banks, will lend to the fund immediately to kick-start the operation. The Italian government is not putting up any of the money directly, although the Cassa Depositi e Prestiti (CDP), a publicly controlled development bank that often comes to the aid of the government, is involved. The proceeds of the eventual sale of the bridge banks, plus any money recovered from the bad debts, will go to the fund.

Sorting out these four banks alone will mop up four years' worth of contributions to the resolution fund, according to RBS, a British bank. Putting all the bad loans in the Italian banking system into a bad bank would be a far more ambitious project. Any such asset-management company could not be financed exclusively by the banks themselves; it would require some form of state backing. That is particularly problematic for the Italian government, whose debts as a share of GDP are second only to Greece's in Europe. Moreover, any initiative has to be approved by the European Commission, which worries that banks would be relieved of their NPLs on overgenerous terms, giving them an unfair advantage. Although it approved several such measures during the heat of the crisis, it is now taking a sterner line. A hybrid solution may be the answer. This could involve a private vehicle whose borrowing would be guaranteed by CDP.

Other steps would still be needed to pep up Italy's lenders. The government is already seeking to rationalise the banking industry by requiring big mutual banks (*popolari*) to turn themselves into joint-stock companies. It has also introduced a reform of bankruptcy proceedings to speed up credit recovery, which can take up to seven years. Italy cannot wait that long to sort out its bad loans. ■

BTG Pactual of Brazil

Deep impact

CURITIBA

Trouble at the most celebrated investment bank in the emerging markets

AS THE founder and boss of BTG Pactual, a Brazilian investment bank, André Esteves has been a shrewd and hyperactive dealmaker. But on November 25th some of those deals appeared to sour, when he was arrested in Rio de Janeiro as part of a vast bribery investigation centred on Petrobras, Brazil's state-controlled oil-and-gas giant.

Prosecutors allege that Mr Esteves and Delcídio do Amaral, a prominent lawmaker from the party of Dilma Rousseff, the president, tried to help Nestor Cerveró, a former Petrobras director who has since been convicted of corruption, to escape trial. According to the police, Mr Esteves was willing to stump up 4m reais (\$1.1m) to spirit him out of the country.

Messrs Esteves and Amaral protest their innocence.

What interest, if any, Mr Esteves might have had in putting Mr Cerveró beyond the reach of the law is unknown. Mr Esteves has always insisted that BTG's investment in Petrobras assets in Africa is spotless. So, he has said, was its involvement with Sete Brasil, a troubled firm that built oil rigs for Petrobras.

Mr Esteves's predicament nevertheless puts pressure on the firm he has led since 2009. A big part of its success was due to the boss's appetite for risk. A slew of acquisitions, most recently of a Swiss private bank earlier this year, helped it grow. It now tops the Latin American advisory league tables for mergers and acquisitions. With assets of 303 billion reais, it is one of the biggest independent investment banks in the emerging markets. Its wealth and asset-management arm steers 650 billion reais of investments, up from 160 billion reais in 2011. Profits have grown, to 3.4 billion reais last year. Return on equity, which has averaged 25% over the past four years, is way above Wall Street levels.

BTG has named Persio Arida, a respected economist and head of its asset-management arm, as interim CEO. But the bank and Mr Esteves remain joined at the hip. He is its controlling shareholder and has "sole discretion" over its policies and management. The morning he was arrested its share price plunged by a quarter. Wags used to quip that BTG stands for Better Than Goldman (rather than Banking and Trading Group); now it could be Ballad of Tropical Gaol.



Trying times for Esteves

Taxing sugary drinks

Stopping slurping

Taxes on fizzy drinks seem to work as intended

AROUND the world, governments and beverage makers are locked in battle over taxes on sugary drinks. Hungary has been taxing them since 2011. In 2012 the French government introduced a tax on all drinks with added sugar or artificial sweetener, now €0.075 (\$0.08) a litre. The Mexican government followed suit last year, with a tax of 1 peso (\$0.06) a litre on all sugary drinks. Chile and the city of Berkeley,

California introduced similar measures in January; Barbados followed suit in June and Dominica in September.

The drinks industry has won some victories too, seeing off proposals for taxes on sugar in several American states and persuading the Slovenian government to backtrack on plans to impose a 10% tax on sweetened drinks last year. In 2013 Denmark repealed its tax on soft drinks and ditched plans for a broader sugar tax.

Governments are adopting the taxes in the hope of trimming bulging waistlines and slowing the rise in diabetes, which cost taxpayers vast sums in spending on health care. Mexicans, for instance, are the fourth-biggest guzzlers of sugary drinks in the world, according to Euromonitor, a market-research firm. In 2012 more than 70% of Mexican adults and 34% of 5-11-year-



It comes at a cost

Olds were overweight. Diabetes is a growing problem: 12% of Mexicans have it, and it was behind 14% of all deaths in 2009. In response, the beverage industry argues that it is not the government's business to decide what people should eat and drink. Pinning the blame for the world's increasingly greedy and sedentary ways on sugary drinks is unfair, they add.

Whether taxes on drinks actually have an effect on consumers is a separate question. Some worry that retailers may absorb the tax rather than passing it on to customers, thereby obscuring the signal governments are trying to send; others, that higher prices will not lead to a change in behaviour, but will simply sap the incomes of the poor in particular.

There is little evidence to support these fears, however. A working paper by economists at the French central bank, the Sorbonne and the University of Paris-Est Créteil found that retailers passed on nearly all of the French tax. A working paper on the Mexican tax by Raymundo Miguel Campos-Vázquez and Eduardo Medina-Cortina of the Colegio de México, a university, finds that retailers there went even further, raising prices for soft drinks by 30% more than the real value of the tax.

Higher prices, in turn, do seem to have crimped demand for fizzy drinks. FEMSA, Coca-Cola's Mexican bottler, blamed declining sales in 2014 on the price jump that followed the introduction of the tax. A monthly manufacturing survey found that overall sales of fizzy drinks fell by 1.9% in 2014, having increased by an average of 3.2% a year over the previous three years (see chart). Another study, based on household surveys rather than industry data, shows an even stronger effect: it found that consumption of sugary drinks fell by 6% relative to pre-tax trends over the tax's first year. Some data suggest that Mexicans switched to healthier alternatives. The manufacturing survey shows that sales of bottled water jumped by 5.2% in 2014.

Not all the evidence from Mexico is in the tax's favour, however. Researchers at the Mexico Autonomous Institute of Technology, who had previously collaborated with the industry on a report into the tax's effects, found that the reduced consumption of sugary drinks thanks to the tax only saved Mexicans five calories a day on average, and what is more, the poor did end up losing a bigger share of their income to the tax than the rich.

However, according to Barry Popkin of the University of North Carolina, low-income households were the most responsive to the tax, cutting their consumption of sugary drinks by 17% within a year of its introduction. That means the poor will gain greater health benefits from the tax. That is especially important since they are hit harder by obesity and diabetes, as they have less access to health care.

Although the academic evidence suggests that taxes on sugary drinks are working as intended, it also indicates that bad design can undermine much of the benefit. For one thing, relatively high taxes are needed to change consumer behaviour. Various states in America have had extra sales taxes on fizzy drinks, of 3-7%. This has

helped to raise revenue, but the impact on consumption has been marginal.

It is also hard to impose a tax on sugary drinks when customers can easily shop elsewhere. Retailers in Berkeley passed on less than half of the city's tax, reckon John Cawley of Cornell University and David Frisvold of the University of Iowa, presumably for fear that customers would drive to neighbouring cities to buy their groceries.

Taxes also work better if they distinguish between different degrees of sugariness. Hungary's tax, which also applies to salt and fat, varies according to the amount of offending ingredient used. A review of the policy found that 40% of manufacturers had adjusted their recipes accordingly.

This fits with the inclination of the drinks industry, which has been experimenting with less sugary drinks. Coca-Cola, for instance, recently launched a product called "Coca-Cola Life", which is made with a mix of sugar and stevia, a calorie-free sweetener. Yet France taxes sugary and diet beverages alike, giving the industry little incentive to make its drinks healthier. Mexico taxes all drinks that contain any added sugar at a flat rate.

Such examples may help governments design more effective taxes on fizzy drinks. But in one crucial respect, the evidence is wanting. The taxes have not been in place long enough to assess their impact, if any, on public health. A proven benefit would really sugar the pill for wary politicians. ■

Big hunk of junk

Share of global corporate bonds rated junk, %



Just 25 years ago less than a quarter of corporate-bond issuers were ranked speculative, or junk. Now, according to Standard & Poor's, a rating agency, it is nearly a half. Growth in the market is due to a number of factors. Investors are more willing to buy high-yield debt, thanks to low interest rates; banks are retreating from corporate lending, particularly in Europe; companies are keen to borrow, given the tax benefits. The shift means the average corporate bond is riskier than it used to be. The default rate is rising, but is still low by historic standards: just 2.5% of issuers defaulted in the year to September.

Losing fizz

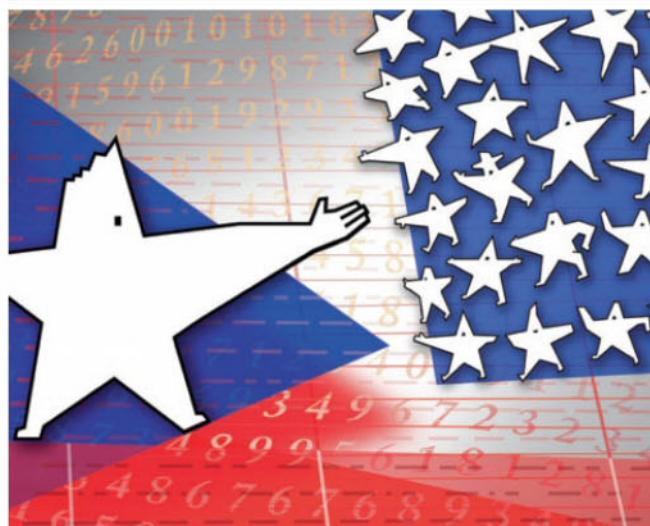
Mexican production* of:
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TAX INTRODUCED



Free exchange | For richer, for poorer

One way or another, America's government will end up bailing out Puerto Rico



IN DECEMBER, as a winter chill descends on the continental United States, temperatures in Puerto Rico often reach 30°C. Palm trees sway alongside the Spanish colonial buildings in Old San Juan; the blue Atlantic stretches to the horizon. Yet the economic outlook for America's Caribbean dependency is anything but sunny. Its government owes \$72 billion in debt, which it says it cannot repay. On December 1st the territory is supposed to make—and is almost certain to miss—a \$354m debt payment. And that is just the first of a series of repayments that add up to \$1.4 billion (or nearly 1.5% of GDP) due in December and January.

Politicians in Washington are scrambling for a solution. The island's fiscal woes are in part the result of chronically bad budgeting. But they also stem from structural economic weakness. Bailing out Puerto Rico, which is self-governing but not a state, is not a popular option. Yet when any corner of America faces a deterioration in its long-run economic fortunes, the costs will end up being shared, one way or another.

For decades Puerto Rico, which is poorer than the mainland, enjoyed a special tax status designed to encourage economic development. From 1976 the income of some manufacturers was exempt from both federal and local tax. Investment poured in, notably in pharmaceuticals. But in the 1990s the tax break fell victim to efforts to balance America's federal budget and was phased out. When it came to an end in 2006, the island sank into a deep and protracted depression. The economy has since shrunk by 14%. Employment is 12% below the peak of 2006. As the economy has withered, obligations to creditors have loomed larger.

Many Puerto Ricans have not waited for a recovery. More than 200 move to the mainland every day. Roughly 5m Americans of Puerto Rican descent live in the continental United States; 3.5m remain on the island. Its labour force has shrunk 11% since 2009.

This migration to more prosperous places saps the Puerto Rican economy of potential, but it is precisely what economists think ought to happen when one region of a larger economy falls on hard times. At 5.7%, the unemployment rate in Detroit, a cash-strapped American city, is ten percentage points below the level of six years ago, when the car industry was in crisis. It would be much higher but for the shrinkage of Detroit's labour force, which has contracted by about 5% since 2009. Between 2000 and 2014

about 90,000 Detroiters, or 2% of the population, moved away. In much of America's industrial heartland, labour forces are shrinking. The migration of working-age adults away from struggling areas reduces joblessness. The country as a whole benefits as labour is drawn toward places that are on the up.

Migration reduces unemployment, but it cannot liberate struggling spots from accrued obligations—most notably pensions. Puerto Rico's biggest government-pension programme has sufficient funds to cover just 0.7% of future obligations. State pension pots are not in quite such bad shape, but massive liabilities still loom. In Illinois, where the labour force has shrunk by about 3% since 2007, pensions are just 39% funded. Puerto Rico will not be the last local government to run out of money.

Perhaps for that reason, many politicians are adamant that the federal government should never rescue insolvent localities. Detroit, for one, was left to write down its debts in bankruptcy court. Puerto Rico cannot do that. The law bars states and territories from declaring bankruptcy, in order to deter profligate behaviour.

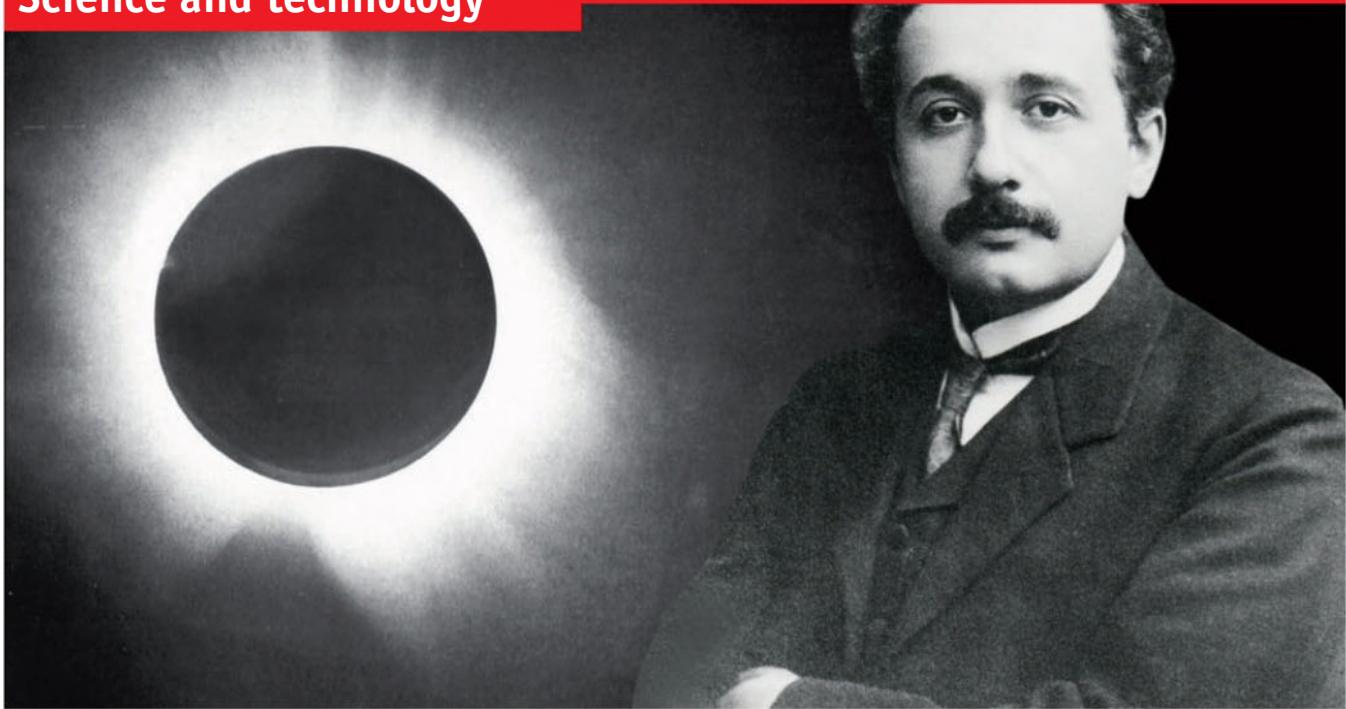
That makes little sense when redistribution among states is already enormous. Because America's tax system is progressive, rich states contribute much more per person to the Treasury than poor ones. Alabama and West Virginia routinely receive more than \$2 in federal spending for each dollar they pay in federal tax; New York and California receive less than \$0.70 on the dollar. Most of the redistribution comes in the form of programmes like Social Security (the national pension scheme) and Medicare (public health insurance for the elderly), for which average spending per person is not that different from one state to another.

During the financial crisis these handouts to poorer regions became even more generous. The federal government stood behind all American banks and borrowed to finance infrastructure spending and increased unemployment benefits. It also took in less tax, offsetting some of the pain of the recession. Indeed, America's fiscal union is so good at absorbing shocks that it is often cited as a model for the more accident-prone euro zone.

In sickness and in health

The administration of Barack Obama has released a sensible plan to repair Puerto Rico's finances. It would allow indebted government agencies, such as the island's power company, to declare bankruptcy, and would provide for a restructuring of other debts and pension obligations. The federal government would also oversee the territory's future public spending; as a sweetener, residents of the territory would gain full access to various anti-poverty schemes that are less generous there than on the mainland.

If Congress spurns this plan, Puerto Rico's government will be forced to raise taxes to crippling levels and slash spending to pay its bills. That would hit the island's residents, 40% of whom live below the poverty line, hard. It is difficult to imagine the federal government ignoring the humanitarian crisis that would probably follow. In addition, emigration to the mainland would presumably jump, initiating a vicious cycle whereby a shrinking tax base leads to rising taxes and curtailed services, prompting further emigration. As American citizens, the migrants will be eligible for public support of various kinds on the mainland. There is no question, in other words, that America will end up bearing much of the cost of Puerto Rico's past profligacy. The only question is how considered and efficient its assistance will be. ■



General relativity

The most beautiful theory

A century ago Albert Einstein changed the way humans saw the universe. His work is still offering new insights today

ALFRED, it's spinning." Roy Kerr, a New Zealand-born physicist in his late 20s, had, for half an hour, been chain-smoking his way through some fiendish mathematics. Alfred Schild, his boss at the newly built Centre for Relativity at the University of Texas, had sat and watched. Now, having broken the silence, Kerr put down his pencil. He had been searching for a new solution to Albert Einstein's equations of general relativity, and at last he could see in his numbers and symbols a precise description of how space-time—the four-dimensional universal fabric those equations describe—could be wrapped into a spinning ball. He had found what he was looking for.

When this happened, in 1962, the general theory of relativity had been around for almost half a century. It was customarily held up as one of the highest intellectual achievements of humanity. And it was also something of an intellectual backwater. It was mathematically taxing and mostly applied to simple models with little resemblance to the real world, and thus not widely worked on. Kerr's spinning solution changed that. Given that pretty much everything in the universe is part of a system that spins at some rate or other, the new solution had a relevance to real-world possibilities—or, rather, out-of-this-

world ones—that previous work in the field had lacked. It provided science with a theoretical basis for understanding a bizarre object that would soon bewitch the public imagination: the black hole.

General relativity was presented to the Prussian Academy of Sciences over the course of four lectures in November 1915; it was published on December 2nd that year. The theory explained, to begin with, remarkably little, and unlike quantum theory, the only comparable revolution in 20th-century physics, it offered no insights into the issues that physicists of the time cared about most. Yet it was quickly and widely accepted, not least thanks to the sheer beauty of its mathematical expression; a hundred years on, no discussion of the role of aesthetics in scientific theory seems complete without its inclusion.

When gravity fails

Today its appeal goes beyond its elegance. It provides a theoretical underpinning to the wonders of modern cosmology, from black holes to the Big Bang itself. Its equations have recently turned out to be useful in describing the physics of earthly stuff too. And it may still have secrets to give up: enormous experiments are under way to see how the theory holds in the most extreme physical environments that the uni-

verse has to offer.

The theory built on the insights of Einstein's first theory of relativity, the "special theory", one of a trio of breakthroughs that made his reputation in 1905. That theory dramatically abandoned the time-honoured description of the world in terms of absolute space and time in favour of a four dimensional space-time (three spatial dimensions, one temporal one). In this new space-time observers moving at different speeds got different answers when measuring lengths and durations; for example, a clock moving quickly with respect to a stationary observer would tell the time more slowly than one sitting still. The only thing that remained fixed was the speed of light, c , which all observers had to agree on (and which also got a starring role in the signature equation with which the theory related matter to energy, $E=mc^2$).

Special relativity applied only to special cases: those of observers moving at constant speeds in a straight line. Einstein knew that a general theory would need to deal with accelerations. It would also have to be reconciled with Isaac Newton's theory of gravity, which relied on absolute space, made no explicit mention of time at all, and was believed to act not at the speed of light but instantaneously.

Einstein developed all his ideas about relativity with "thought experiments": careful imaginary assessments of highly stylised states of affairs. In 1907 one of these provided him with what he would later refer to as his "happiest thought": that someone falling off a roof would not feel his own weight. Objects in free-fall, he realised, do not experience gravity. But the curved trajectories produced by gravity—be they the courses of golf balls or plan- ➤

ents—seemed to imply some sort of pushing or pulling. If golf balls and planets, like people falling off roofs, felt no sort of push or pull, why then did they not fall in straight lines?

The central brilliance of general relativity lay in Einstein's subsequent assertion that they did. Objects falling free, like rays of light, follow straight lines through space-time. But that space-time itself is curved. And the thing that made it curve was mass. Gravity is not a force; it is a distortion of space-time. As John Wheeler, a physicist given to pithy dictums about tricky physics, put it decades later: "Space-time tells matter how to move; matter tells space-time how to curve."

The problem was that, in order to build a theory on this insight, Einstein needed to be able to create those descriptions in warped four-dimensional space-time. The Euclidean geometry used by Newton and everyone else was not up to this job; fundamentally different and much more challenging mathematics were required. Max Planck, the physicist who set off the revolution in quantum mechanics, thought this presented Einstein with an insurmountable problem. "I must advise you against it," he wrote to Einstein in 1913, "for in the first place you will not succeed, and even if you succeed no one will believe you."

Handily for Einstein, though, an old university chum, Marcel Grossmann, was an expert in Riemannian geometry, a piece of previously pure mathematics created to describe curved multi-dimensional surfaces. By the time of his lectures in 1915 Einstein had, by making use of this unorthodox geometry, boiled his grand idea down to the elegant but taxing equations through which it would become known.

Just before the fourth lecture was to be

delivered on November 25th, he realised he might have a bit more to offer than thought experiments and equations. Astronomers had long known that the point in Mercury's orbit closest to the sun changed over time in a way Newton's gravity could not explain. In the 1840s oddities in the orbit of Uranus had been explained in terms of the gravity of a more distant planet; the subsequent discovery of that planet, Neptune, had been hailed as a great confirmation of Newton's law. Attempts to explain Mercury's misbehaviour in terms of an undiscovered planet, though, had come to naught.

Famous long ago

Einstein found that the curvature of space-time near the sun explained Mercury's behaviour very nicely. At the time of the lectures it was the only thing he could point to that general relativity explained and previous science did not. Martin Rees, Britain's Astronomer Royal, is one of those who sees the nugatory role played by evidence in the development of the theory as one of the things "that makes Einstein seem even more remarkable: he wasn't motivated by any mysterious phenomena he couldn't explain." He depended simply on his insight into what sort of thing gravity must be, and the beauty of the mathematics required to describe it.

After the theory was published, Einstein started to look for ways to test it through observation. One of them was to compare the apparent positions of stars that were in the same part of the sky as the sun during a solar eclipse with their apparent positions at other times. Rays of light, like free-falling objects, trace straight lines in space-time. Because the sun's mass warps that space-time, the positions of the

stars would seem to change when the rays skirted the sun (see diagram).

In 1919 Arthur Eddington, a famed British astronomer, announced that observations of an eclipse made on the Atlantic island of Principe showed just the distortion Einstein had predicted (one of his images is reproduced on the previous page). "LIGHTS ALL ASKEW IN THE HEAVENS", read the New York Times headline, adding helpfully that "Nobody Need Worry". Einstein, while pleased, had faith enough in his idea not to have been on tenterhooks. When asked what he would have done had Eddington found a different result, he replied, "Then I would feel sorry for the good Lord. The theory is correct."

As far as the rest of the world was concerned, Eddington's result put general relativity more or less beyond doubt. But that did not make it mainstream. For one thing it was hard to grasp. At a public event Eddington was momentarily stumped by the suggestion that he "must be one of the three persons in the world who understand general relativity". When the silence was taken for modesty, he replied "On the contrary, I am trying to think who the third person is!"

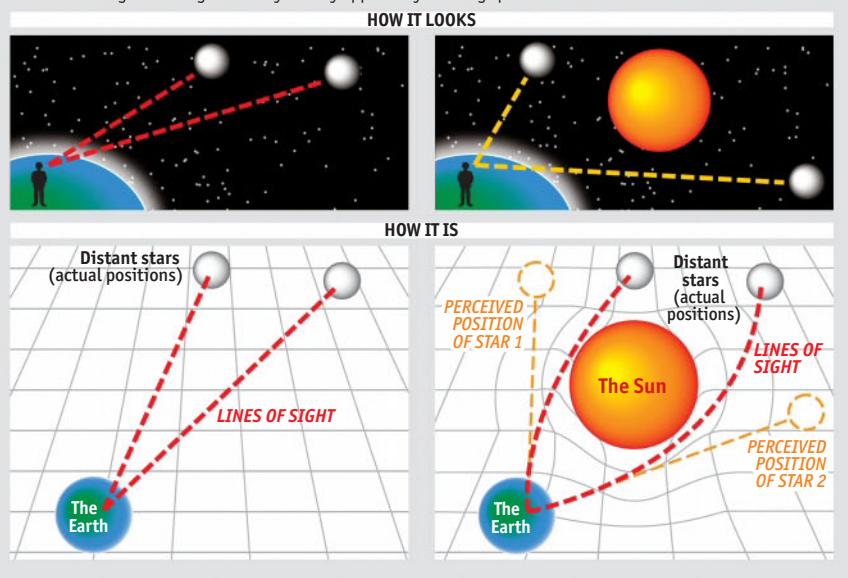
General relativity also seemed somewhat beside the point. The quantum revolution that Planck had begun, and that Einstein had contributed to in one of his other great papers of 1905, was bearing fascinating fruit. Together with a blossoming understanding of the atomic nucleus, it was at the centre of physicists' attention. Special relativity had a role in the excitement; its most famous expression, $E=mc^2$, gave a measure of the energy stored in those fascinating nuclei. General relativity had none.

What it offered instead was a way to ask questions not about what was in the universe, but about the structure of the universe as a whole. There were solutions to the equations in which the universe was expanding; there were others in which it was contracting. This became a topic of impassioned debate between Einstein and Willem de Sitter, a Dutch physicist who had found one of the expanding-universe solutions. Einstein wanted a static universe. In 1917 he added to his equations a "cosmological constant" which could be used to fix the universe at a given size.

That became an embarrassment when, in 1929, an American astronomer put forward strong evidence that the universe was, indeed, getting bigger. Edwin Hubble had measured the colour of the light from distant galaxies as a way of studying their motion; light from objects approaching the Earth looks bluer than it would otherwise, light from objects receding looks redder. Hubble found that, on average, the more distant the galaxy, the more its light was shifted towards the red; things receded faster the farther away they were. The evidence for an expanding universe these red-

Lights all askew in the heavens

The intervening sun changes the way the sky appears by bending space-time





► shifts provided led Einstein to reject the cosmological constant as the “greatest blunder of my life”.

The theory had other implications at which its architect initially balked. In the 1930s nuclear physicists worked out that stars were powered by nuclear reactions, and that when those reactions ran out of fuel the stars would collapse. Something like the sun would collapse into a “white dwarf” about the size of the Earth. Bigger stars would collapse yet further into “neutron stars” as dense as an atomic nucleus and just 20 kilometres or so across. And the biggest stars would collapse into something with no length, breadth or depth but infinite density: a singularity.

Finding singularities in a theory is highly distasteful to the mathematically minded; they are normally signs of a mistake. Einstein did not want any of them in his universe, and in 1939 he published a paper attempting to show that the collapse of giant stars would be halted before a singularity could be formed. Robert Oppenheimer, a brilliant young physicist at Berkeley, used the same relativistic physics to contradict the great man and suggest that such extreme collapses were possible, warping space-time so much that they would create regions from which neither light nor anything else could ever escape: black holes.

Oppenheimer’s paper, though, was published on the day Germany invaded Poland, which rather put the debate on hold. Just a month before, Einstein had written to Franklin Roosevelt highlighting the military implications of $E=mc^2$; it would be for realising those implications, rather than for black holes, that Oppenheimer would be remembered.

In part because of Oppenheimer’s government-bewitching success, new sorts of physical research flourished in the post-war years. One such field, radio astronomy, revealed cosmic dramas that observations using light had never hinted at.

Among its discoveries were sources of radio waves that seemed at the same time small, spectacularly powerful and, judging by their red-shifts, phenomenally distant. The astronomers dubbed them quasars, and wondered what could possibly produce radio signals with the power of hundreds of billions of stars from a volume little bigger than a solar system.

Roy Kerr’s solution to the equations of general relativity provided the answer: a supermassive spinning black hole. Its rotation would create a region just outside the hole’s “event horizon”—the point of no return for light and everything else—in which matter falling inward would be spun up to enormous speeds. Some of that matter would be squirted out along the axis of rotation, forming the jets seen in radio observations of quasars.

Disappear like smoke

For the first time, general relativity was explaining new phenomena in the world. Bright young minds rushed into the field; wild ideas that had been speculated on in the fallow decades were buffed up and taken further. There was talk of “wormholes” in space-time that could connect seemingly distant parts of the universe. There were “closed time-like curves” that seemed as though they might make possible travel into the past. Less speculatively, but with more profound impact, Stephen Hawking, a physicist (pictured, with a quasar), and Roger Penrose, a mathematician, showed that relativistic descriptions of the singularities in black holes could be used to describe the Big Bang in which the expansion of the universe began—that they were, in fact, the only way to make sense of it. General relativity gave humans their first physical account of the creation.

Dr Hawking went on to bring elements of quantum theory into science’s understanding of the black hole. Quantum mechanics says that if you look at space on the

tiniest of scales you will see a constant ferment in which pairs of particles pop into existence and then recombine into nothingness. Dr Hawking argued that when this happens at the event horizon of a black hole, some of the particles will be swallowed up, while some will escape. These escaping particles mean, in Dr Hawking’s words, that “black holes ain’t so black”—they give off what is now called “Hawking radiation”. The energy lost this way comes ultimately from the black hole itself, which gives up mass in the process. Thus, it seems, a black hole must eventually evaporate away to nothingness.

Adding quantum mechanics to the description of black holes was a step towards what has become perhaps the greatest challenge in theoretical physics: reconciling the theory used to describe all the fields and particles within the universe with the one that explains its overall shape. The two theories view reality in very different ways. In quantum theory everything is, at some scale, bitty. The equations of relativity are fundamentally smooth. Quantum mechanics deals exclusively in probabilities—not because of a lack of information, but because that is the way the world actually is. In relativity all is certain. And quantum mechanics is “non-local”; an object’s behaviour in one place can be “entangled” with that of an object kilometres or light-years away. Relativity is proudly local; Einstein was sure that the “spooky action at a distance” implied by quantum mechanics would disappear when a better understanding was reached.

It hasn’t. Experiment after experiment confirms the non-local nature of the physical world. Quantum theory has been stunningly successful in other ways, too. Quantum theories give richly interlinked accounts of electromagnetism and of the strong and weak nuclear forces—the processes that hold most atoms together and split some apart. This unified “standard model” now covers all observable forms of matter and all their interactions—except those due to gravity.

Some people might be satisfied just to let each theory be used for what it is good for and to worry no further. But people like that do not become theoretical physicists. Nor will they ever explain the intricacies of the Big Bang—a crucible to which grandiose theory-unifiers are ceaselessly drawn. In the very early universe space-time itself seems to have been subject to the sort of fluctuations fundamental to the quantum world (like those responsible for Hawking radiation). Getting to the heart of such shenanigans requires a theory that combines the two approaches.

There have been many rich and subtle attempts at this. Dr Penrose has spent decades elaborating an elegant way of looking at all fields and particles as new mathematical entities called “twistors”. Others ►

► have pursued a way of adding quantum bittiness to the fabric of space-time under the rubric of “loop quantum gravity”. Then there is the “Exceptionally Simple Theory of Everything”—which isn’t. As Steven Weinberg, one of the unifiers whose work built the standard model, puts it, “There are so many theories and so few observations that we’re not getting very far.”

Dr Weinberg, like many of his colleagues, fancies an approach called superstring theory. It is an outgrowth of an outgrowth of the standard model with various added features that seem as though they would help in the understanding of space-time and which its proponents find mathematically beguiling. Ed Witten of the Institute for Advanced Study (IAS) in Princeton, Einstein’s institutional home for the last 22 years of his life, is one of those who has raised it to its current favoured status. But he warns that much of the theory remains to be discovered, and that no-one knows how much. “We only understand bits and pieces—but the bits and pieces are staggeringly beautiful.”

This piecemeal progress, as Dr Witten tells it, offers a nice counterpoint to the process which led up to November 1915. “Einstein had the conception behind general relativity before he had the theory. That’s in part why it has stood: it was complete when it was formulated,” he says. “String theory is the opposite, with many manifestations discovered by happy accident decades ago.”

Entangled up in blue

And the happy accidents continue. In 1997 Juan Maldacena, an Argentine theoretician who now also works at the IAS, showed that there is a deep connection between formulations of quantum mechanics known as conformal field theories and solutions to the Einstein equations called anti-de Sitter spaces (similar to the expanding-universe solution derived by Willem de Sitter, but static and much favoured by string theorists). Neither provides an account of the real world, but the connection between them lets physicists recast intractable problems in quantum mechanics into the sort of equations found in general relativity, making them easier to crack.

This approach is being gainfully employed solving problems in materials science, superconductivity and quantum computing. It is also “influencing the field in a totally unexpected way,” says Leonard Susskind, of Stanford University. “It’s a shift in our tools and our methodology and our way of thinking about how phenomena are connected.” One possibility Dr Maldacena and Dr Susskind have developed by looking at things this way is that the “wormholes” relativity allows (which can be found in the anti-de Sitter space) may be the same thing as the entanglement between distant particles in quantum me-

chanics (which is part of the conformal field theory). The irony of Einstein’s spooky quantum *bête noire* playing such a crucial role has not gone unremarked.

There is more to the future of relativity, though, than its eventual subsumption into some still unforeseeable follow-up theory. As well as offering new ways of understanding the universe, it is also providing new ways of observing it.

This is helpful, because there are bits of the universe that are hard to observe in other ways. Much of the universe consists of “dark matter” which emits no radiation. But it has mass, and so it warps space, dis-

gy, it was realised that these neutron stars should be losing some. And so they proved to be—at exactly the rate that relativity predicts. This indirect but convincing discovery garnered a Nobel prize in 1993.

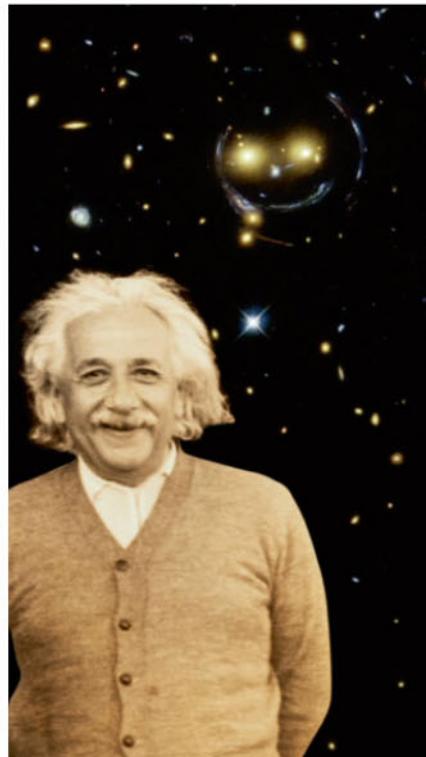
As yet, though, no one has seen a wave in action by catching the expansion and contraction of space that should be seen as one goes by, because the effects involved are ludicrously small. But researchers at America’s recently upgraded Laser Interferometer Gravitational-wave Observatory (LIGO) now think they can do it. At LIGO’s two facilities, one in Louisiana and one in Washington state, laser beams bounce up and down 4km-long tubes dozens of times before being combined in a detector to make a pattern. A passing gravitational wave that squashes space-time by a tiny fraction of the radius of an atomic nucleus in one arm but not the other will make a discernible change to that pattern. Comparing measurements at the two sites could give a sense of the wave’s direction.

Step into the light

The aim is not just to detect gravitational waves—though that would be a spectacular achievement—but to learn about the processes that produce them, such as mergers of neutron stars and black holes. The strengths of the warping effects in such cataclysms are unlike anything seen to date; their observation would provide a whole new type of test for the theory.

And history suggests there should be completely unanticipated discoveries, too. Kip Thorne, a specialist in relativity at the California Institute of Technology and co-founder of LIGO, says that “every time we’ve opened a new window on the cosmos with new radiation, there have been unexpected surprises”. For example, the pioneers of radio astronomy had no inkling that they would discover a universe full of quasars—and thus black holes. A future global array of gravitational-wave observatories could open a whole new branch of observational astronomy.

A century ago general relativity answered no-one’s questions except its creator’s. Many theories are hit upon by two or more people at almost the same time; but if Einstein had not devoted years to it, the curvature of space-time which is the essence of gravity might not have been discovered for decades. Now it has changed the way astronomers think about the universe, has challenged them to try and build theories to explain its origin, and even offered them new ways to inspect its contents. And still it retains what most commended it to Einstein: its singular beauty, revealed first to his eyes alone but appreciated today by all who have followed. “The Einstein equations of general relativity are his best epitaph and memorial,” Stephen Hawking has written. “They should last as long as the universe.” ■



torting the picture of more distant objects just as the eclipse-darkened sun distorted the positions of Eddington’s stars. Studying distortions created by such “gravitational lenses”—both luminous (pictured, with Einstein) and dark—allows astronomers with the precise images of the deep sky today’s best telescopes provide to measure the distribution of mass around the universe in a new way.

Another form of relativity-assisted astronomy uses gravitation directly. Einstein’s equations predict that when masses accelerate around each other they will create ripples in space-time: gravitational waves. As with black holes and the expanding universe, Einstein was not keen on this idea. Again, later work has shown it to be true. A pair of neutron stars discovered spinning round each other in the 1970s are exactly the sort of system that should produce such waves. Because producing gravitational waves requires ener-

Contemporary art

Seize the day

HAVANA

Interest in Cuban art is taking off

THE dingy back alleys of Havana are a far cry from the city's middle-class Vedado district and its Hotel Nacional, and an unlikely home for a hip international art gallery. But on November 27th Galleria Continua, an avant-garde group from San Gimignano in Tuscany that shows Anish Kapoor and Michelangelo Pistoletto and has offshoots in Beijing and Boissy-le-Châtel, an hour's drive south of Paris, opened its newest space in the renovated Aguila de Oro cinema. The chunky Soviet-era projectors have been left in place on the top floor, and the detritus of film canisters and decaying seats has been whipped into a floor-to-ceiling hurricane installation by José Yaque, a young Cuban artist.

Continua's opening is just the latest sign that the global art world—which, on December 3rd, will gather at Art Basel Miami Beach, America'suzziest art fair—is on to Cuba. Collectors, dealers and museum curators have been flocking to Havana. The re-establishment of diplomatic ties between America and the Caribbean island in earlier this year mean that interest in Cuban art can only grow.

Many of the better-known Cuban artists of the 20th century, among them Wifredo Lam, Ana Mendieta and Félix González-Torres, were born on the island but, for various different reasons, ended up working abroad. They are more associated with modernist painting, performance art and queer art, respectively, than with their homeland.

The 1959 revolution and the ensuing embargo isolated Cuba. But its rich national art school in Havana, the Instituto Superior de Arte (isa), continued to produce artists of talent, who were admired for their technical skill and background. Tomás Sánchez, a realist painter, for example (the third-best-selling Cuban artist according to the Artnet, an auction database), cites Andrew Wyeth as an influence, but also two Russian realists, Isaak Levitan and Ivan Shishkin.



Sign of the times

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tion of non-Western art, and became a high street for collecting tourists. Within less than a decade, Mr Camnitzer estimates, as many as 10,000 Americans (able to get around the embargo thanks to an exemption that classified art as "information materials") were visiting the Biennial.

Cuba's art studios have long had a dedicated following among collectors. These include trustees on trips organised by their museums—last month Alice Walton's Crystal Bridges Museum of American Art in Bentonville, Arkansas, paid a record \$7.7m for an important work by González-Torres, "Untitled (L.A.)". Peter and Irene Ludwig, well-known German collectors, wanted to create a museum in Havana in the special period, but found conditions inhospitable. Instead their foundation gives grants to Cuban artists and has been instrumental in connecting those who grew up in the special period with the outside world. Ella Fontanals-Cisneros, whose family fled Cuba when she was a teenager and who is now known for her foundation in Miami, also takes groups of collectors to Havana.

Some collectors, such as Howard Farber, buy Cuban art in anticipation of a payday. In 2007 he put up for auction at Philips in London a collection of Chinese contemporary art, which he had assembled cheaply from the late 1980s onwards. The sale made \$20m; one piece went for 64 times the price he paid for it. Mr Farber started collecting Cuban art in 2001 in a similar way. "I see the same thing happening with Cuban contemporary art," he said of the art boom that followed China's opening up. "Only I see it a little bigger because it's closer to the United States." He has even started a website Cuban Art News to promote the cause.

Today's leading artists came of age in the special period and are clued up about the international market. Carlos Garaicoa reinterprets Cuba's unique architecture through ▶

► installations, photographs and drawings. Yoan Capote makes ambitious sculptures with Cuban twists, most recently a series of seascapes that use thousands of fish hooks instead of paint. Their work is now said to sell for around \$80,000.

The ones who stand out are shown in New York. Since 2010 Mr Capote has been with the Jack Shainman Gallery. Another New York dealer, Sean Kelly, points out that the ISA has long turned out artists of great technical ability; with the opening up of Cuba, the most successful will be those who also use their skills conceptually to project a unique voice. Mr Kelly will show Diana Fonseca Quiñones in January and Alejandro Campins in February. For the past decade he has represented an energetic group, Los Carpinteros, who make humorous odes to Cuban shoddiness with installations, sculptures and drawings.

Earlier this month an auction of Latin American art at Christie's in New York produced three new records for Cuban artists: José Angel Rosabal, Rubén Alpízar and Roberto Fabelo. Fourteen Cuban artists will be featured at Art Basel Miami Beach, up from two last year, among them Los Carpinteros, Mr Capote and Mr Garaicoa. There will also be a film by Mendieta and a lecture on the "New Role for Art in Cuba" with Mr Garaicoa. Galerie Nathalie Obadia will show photos by Agnès Varda taken in Cuba between 1962 and 1963. Work by Jorge Pardo, an architect and sculptor, will be at the Petzel Gallery. Luis Miret Pérez, of Galería Habana—one of Cuba's top galleries—described this year's Havana Biennial as a "hurricane" of buying. Strap in, then, because the storm seems only to be picking up. ■

Food politics in America

Popped

Soda Politics: Taking on Big Soda (and Winning). By Marion Nestle. Oxford University Press; 508 pages; \$29.95 and £19.99

MARION NESTLE'S heavyweight polemic against Coca-Cola and PepsiCo comes at an odd moment for the industry. Americans are drinking fewer sugary sodas—in 2012 production was 23% below what it had been a decade earlier. Even sales of diet drinks are losing their fizz, as consumers question the merits of artificial sweeteners. From one angle, it would seem that health advocates such as Ms Nestle have won. Yet in America companies still produce 30 gallons of regular (not diet) fizzy drinks per person per year. In many countries, particularly developing ones, consumption is on the rise.



Ms Nestle, a professor at New York University, is both heartened by recent progress and dissatisfied with it. That is no surprise. Her first book, "Food Politics" (2002), remains a bible for those who bewail the power of food companies. In her new book she attacks the industry's most widely consumed, least healthy product. "Soda Politics", she says, is a book "to inspire readers to action". As a rallying cry, it is verbose. When readers learn on page 238 that she will pick up a particular subject in chapter 25, it is with no little dismay that they realise they are only on chapter 17. But what the author wants most is to craft a meticulous guide to the producers' alleged transgressions, and how to stop them.

Ms Nestle says she would have no quibbles with sweet fizzy drinks if they were sipped occasionally, as a treat. However, for millions of people in many countries, they are not. In Mexico companies sold 372 cans of fizzy drinks per person in 2012. About half of Americans do not drink them regularly, but those who do are disproportionately poor, less educated, male, Hispanic or black. Ten per cent of Americans down more than four cans a day.

Drinking a lot of sweet fizzy drinks is plainly unhealthy. Unlike a Big Mac, they have no nutritional value; nor do their calories satisfy hunger. One large study found that for each can added to a person's daily diet, the risk of diabetes jumped by 22%. There are also links between sugar and heart disease, stroke and cancer. Drinking lots of sodas imposes clear costs on individuals, Ms Nestle argues, but it has a broader cost, too. American taxpayers subsidise corn production (and thereby corn

syrup) and let the poor use government food vouchers to buy fizzy drinks. More important, taxpayers foot the health bill for those who develop chronic disease.

Encouraging people to drink fewer fizzy drinks, however, is fiendishly difficult. Soda companies spend billions on marketing; it is a tribute to the admen that Coca-Cola is one of the world's best-loved brands, despite selling what is essentially fattening sugar-water. (Think of Coca-Cola's encouragements to "open happiness" and PepsiCo's exuberant spokeswoman, Beyoncé Knowles.) Once people get used to consuming sugary drinks, they are loth to give them up. There is evidence suggesting that sugar is addictive—some laboratory animals prefer sugar to cocaine.

Most interesting, fizzy-drink companies are skilled at swatting away attempts at regulation. Ms Nestle describes an extraordinarily broad team of allies. That includes obvious friends, such as employees, bottlers and distributors, as well as the restaurants, cinemas, shops and sports stadiums that sell their products. But the companies are also astute philanthropists. When Michael Bloomberg, then mayor of New York, tried to block the use of government vouchers to buy sodas in 2010, the congressional black caucus was among those to lobby against it. The caucus's foundation has received money from both Coke and Pepsi. In 2011 Philadelphia was considering a soda tax. After the soda lobby offered a big donation to the city's children's hospital, the idea fizzled out.

Coca-Cola and PepsiCo do have a few notable adversaries. Mr Bloomberg, a billionaire, remains their single biggest foe. It is telling that in two rare instances when a soda tax has been passed—in Berkeley, California and in Mexico—it was with the help of cash from Mr Bloomberg. Drinks companies must also reckon with a small army of health advocates, among which Ms Nestle is a major-general.

With the slow decline of soda in America, she and her allies are advancing. Coca-Cola and PepsiCo are peddling healthier drinks, such as bottled water. However, as they try to face down a long-term threat while maintaining near-term profits, they are still pushing their syrupy fare.

Ms Nestle is impatient. To the casual reader, her suggestions can seem extreme. She writes enthusiastically about adorning soda cans with warning labels, such as pictures of a diabetic's foot ulcer. She suggests that parents should teach their children about fizzy drinks by gently boiling down a Coke or a Pepsi into sludge, which sounds rather fun, and asking them to calculate the precise length of grocery shelves bearing sodas, which sounds less so. This zeal threatens to overshadow her stronger points: fizzy drinks offer no nutritional benefit and impose clear costs—on individuals' health and on society. ■

The Maldives islands

A darker shade of blue

The Maldives: Islamic Republic, Tropical Autocracy. By J.J. Robinson. Hurst; 336 pages; £16.99

TROUBLED paradises dot the tropics. Equatorial Guinea, Haiti and the Solomon Islands are just three examples. Add to that list the Maldives, a micro-nation blighted by repression, political gangsters and, increasingly, Wahhabi extremists. Life on the islands in the Indian Ocean can be stultifying. Bored youngsters in Malé, the crowded capital, are heavy consumers of brown-sugar heroin. Few places look quite so fragile environmentally. A fire last year at the country's only desalination plant left it with almost no drinking water.

Yet the story of the Maldives is complicated, because the islands also offer real glimmers of hope. Since the 1970s the small population, around 350,000, has built a luxury-tourist industry that is worth \$2.5 billion a year. Maldivians are easily the most prosperous of all South Asians; the country draws Bangladeshis and others to work there. While he was president, Mohamed Nasheed, a bright figure, did much to champion concerns about climate change and promote liberal values at home. The past decade has brought real, if now faltering, democratic gains.

Little is published on the Maldives, travel bumf aside, so it can be hard for analysts to judge whether gloom or hope is ascendant there. J.J. Robinson's new book is a rare, welcome contribution. A British-Australian who for several years edited *Minnivan News*, easily the country's best newspaper, he reported close-up on matters to which few outsiders pay great attention.

He finds a lot that is worrying. Socially, the country is growing more intolerant. Those caught having extramarital sex can

be punished with a public flogging—and it is mostly women who are abused in this way. Self-declared atheists are pilloried, sometimes to the point of suicide. Women feel under pressure to swelter under a heavy *niqab*. Religious extremism is growing: probably nowhere else, per person, sends as many recruits to fight with Islamic State.

National politics has long been a mess, and Mr Robinson sees it only getting worse. Political affairs are largely run by several wealthy, resort-owning families, whom he calls "oligarchs"; they also oversee drug- and alcohol-smuggling gangs. Bent judges make life difficult for Mr Nasheed and the rest of the opposition. Paid thugs do their bit, torching newspaper offices, abducting a journalist a year ago whose fate is still unknown, and killing an MP who was seen as a religious moderate.

The high point of democracy was in 2008, when Mr Nasheed was elected president. But the oligarchs forced him from office four years later in what amounted to a coup. He was the front-runner in an eventual follow-up election, but after several postponements another man won.

Young Maldivians, avid users of social media and more and more well educated, are now determined to create a more liberal place. Diplomatic interventions from India, America and the Commonwealth help to preserve some democratic freedoms. Even the ruling families know repression and zealotry must have limits, lest they scare off foreign tourists who account for most of the country's revenues.

Mr Robinson might have explained more fully why the Maldives matters to outsiders. The country sits on strategically important shipping lanes between Asia and Europe and, in recent years, has drawn intense diplomatic and trade interest from China, which now supplies it with more tourists than anywhere else. In turn nearby India, supported by America, worries about China's growing influence. The tiny islands are a focus of geopolitics; interest in this troubled paradise will only rise. ■

Dead bodies

Dust to dust

The Work of the Dead: A Cultural History of Mortal Remains. By Thomas Laqueur.

Princeton University Press; 711 pages; \$39.95 and £27.95

THOMAS LAQUEUR, a professor of history at University of California, Berkeley, opens his new book with the story of Diogenes the Cynic, a philosopher from ancient Greece who asked his friends not to bury his body when he died, but to throw it out for the beasts. When they demurred, he mocked them. He knew that corpses are insensate matter, nothing more; loam, as Hamlet said later, with which to stop a bunghole.

Death, Mr Laqueur insists, has never been a mystery. Dust to dust, says the Christian burial service, whatever it says about the resurrection of the body. The real mystery has been peoples' resistance to what they know. Though he concentrates on North America and western Europe (largely England and France), Mr Laqueur shows that, in every age and place, people have always needed their corpses. Sacred or secular makes no difference.

Believers in a bodily afterlife may seem to have the edge. But atheists have matched them bone for bone, especially the bones of their rationalist philosophers. Voltaire, for example, exhumed in 1791 and carried in Roman pomp to the Panthéon, France's secular temple to the revolution; or the body of Karl Marx himself, buried in Highgate cemetery in north London, a point of pilgrimage and a focus for the bodies of his followers.

All this is a kind of magic, pulled off in spite of ourselves. It is what Mr Laqueur means by his title, "The Work of the Dead": the cultural task people demand of the dead of concealing the bare facts of biology. People lay upon the dead, he says, "the burden of our very biggest ideas, of a vast, oceanic repertoire of meanings". This book is crammed with bodies and meanings: special bodies near altars and the relics of saints; bodies of the parish in churchyards, communities in God; the bodies of suicides and the unbaptised in unconsecrated corners. There are Enlightenment bodies in Elysium, contrived by landscape gardeners; and their successors, citizens of the world, in cosmopolitan cemeteries. Some are names only, inscribed on monuments of war and mourning.

Every circumstance comes laden with history and genealogies of ideas. A large part of the book is devoted to the slow transition from churchyards to cemeteries, a story of changing sensibilities, epitomised ►



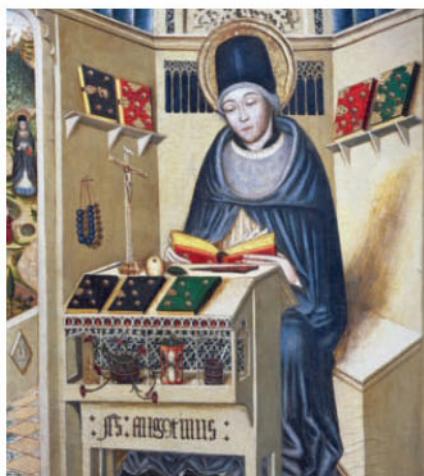
Let it not become paradise lost

▶ by the gradual replacement of the epitaph *Hic jacet* ("Here lies the body...") by the less corporeal "In memory of...". It is about the rise of material refinement during the 18th century, about anticlericalism and the decline of superstition. Once death was "stripped of superstition", writes Mr Laqueur "and revealed in all its natural boldness", the enlightened world recoiled. Disgust took hold—so much so that Mr Laqueur identifies "a new group of people" who "managed to capture smell for its worldview". True, churchyards and crypts were overflowing and thought to be unhealthy. But death needed a more fundamental makeover. Worms and skulls were out. Or if there must be a skeleton, said one Enlightenment aristocrat designing his tomb, let it be veiled.

A veiled way of imagining death needed a different kind of space. Elysium and Arcadia, nymphs and shepherds, were already familiar from the long tradition of pastoral poetry and from paintings—in particular, Nicolas Poussin's "The Arcadian Shepherds" from 1637-38. Architects and landscape gardeners working on grand English estates—Sir John Vanburgh at Castle Howard and Stowe, William Kent at Rousham—were creating them on the ground. Here was something to trump the churchyard. Serene and clean, the classical world appealed to the hygienists and sanitation men too, to become the inspiration for cemeteries. "Death and prettiness!", exclaimed one visitor to Kensal Green cemetery in 1833. "What ill-assorted images." There was nothing, he complained, to remind the visitor of "the heaps of mouldering human dust".

And the unenlightened? Much of Mr Laqueur's book is about ordinary and marginal people, who for one reason or another are denied their idea of decent burial. This is where the dead body comes closest to Diogenes, and where it matters most keenly. There is a story of riots in the 1870s near Oxford against a vicar who had refused burial rites to a disreputable local character. The crowd broke into the church, carried in the nine-day-old corpse, and forced a reading of the service. There is another tale of Portuguese peasant women tearing down cemetery walls and exhuming bodies for churchyard reburials. More quietly, there is the plight of Victorian paupers, starving to save pennies for something better than the workhouse pit or the dissecting table. "Why the dead matter", says Mr Laqueur, "...is not grounded in knowledge, science, morality, or metaphysics but in deep structures of intuition and feeling."

"The Work of the Dead" is an enormous, erudite, sprawling, garrulous, exhausting and brilliant piece of work. And it never forgets that thread of "intuition and feeling". Diogenes will be turning in his grave. ■



St Augustine

O come all ye faithful

Augustine: *Conversions and Confessions*.

By Robin Lane Fox. *Basic Books*; 672 pages; \$35. *Allen Lane*; £30

AN INTELLECTUAL colossus of late antiquity, Augustine of Hippo straddled many worlds. Born in north Africa in a town of Romanised Berbers, he moved confidently around the empire's Italian heartland, which although under terminal threat was still a very sophisticated place. He was sufficiently clever, eloquent and sociable to have made a grand worldly career; instead he devoted his life to articulating a philosophical system that fused Greco-Roman ideas with those of Semitic monotheism. He was a sensual man who embraced celibacy, while rejecting worldviews that divided the material from the spiritual. He could speak with magisterial authority and great vulnerability.

Robin Lane Fox, a historian of classical antiquity at Oxford University, finds him captivating. This is not for spiritual reasons (he does not share his subject's faith) but because of the light Augustine shed, in more than one sense, on the dying *imperium*. His is the best-known life in the ancient world.

This book interweaves political, military and personal history to describe in detail the first four decades of Augustine's life (he died at 75); in other words, the time leading up to his "Confessions", a work which in Mr Lane Fox's view was composed in a short space of time in 397AD.

The "Confessions" are certainly worth setting in context. They are a very unusual piece of writing, ranging from memoir and introspection to elaborate theological reasoning; the whole thing takes the form of a passionately delivered prayer. To situate this vastly influential work, Mr Lane Fox explores everything that is known

about the great teacher's life and social world, including his various lovers and intellectual partners.

But not all readers will find the author's fascination with Augustine infectious. The Christian teacher can be disarmingly frank (he passes into popular culture with outbursts like "Make me virtuous, but not yet"). But his public introspection can seem narcissistic, even to a modern sensibility that is used to psycho-jargon.

As the book shows, Augustine's vocation to be a master-synthesiser led him to some pessimistic conclusions about man's relationship with God. The process started when he embraced and then firmly rejected the Manichean religion which made a radical separation between good and evil, the spiritual and the physical, and also between the Old and New Testaments.

In other words, Augustine moved from a world-view based on sharp division to one that tried to hold everything together. He struggled to reconcile the God of ancient Israel, who could seem inexplicably unfair (why did Jacob fare so much better than his brother Esau?) with the Christian God of love. His solution was to stress man's sinfulness and inability, through his own efforts, to redeem himself.

Many Christians today are discomfited by Augustine's downbeat views on human nature. Christians of the east have always thought he went overboard in his doctrine of original sin: the idea that all human beings have inherited guilt from Adam and must rely on God alone to raise them up from this dire condition.

As the book recalls, Augustine's belief that people inherit sin and mortality from Adam is in part based on a misreading of a line in Saint Paul's letter to the Romans, whose meaning is clearer in the original Greek (a language which Augustine struggled to master) than in the Latin translations. With typical precision, Mr Lane Fox pinpoints the moment when Augustine arrived at his pessimistic view of mankind, one that gave human beings little prospect of escaping the fate that God had assigned to them. It was in a letter to Simplicianus, a churchman in Milan. God, he wrote, for his own inscrutable reasons, has chosen to remake certain people as vessels of beauty, while consigning others to ignominy; it was not for humans to reason why.

This grim conclusion is probably less depressing to a scholar like Mr Lane Fox, who views Augustine through the lens of secular history, than it is to somebody who turns to Augustine in search of spiritual inspiration. Over the centuries, Augustine's highly charged prose and large personality have impressed many generations of Europeans, including the pioneers of the Renaissance whose humanist world-view was at the opposite extreme to his. But there are many who, for good reason, prefer the style to the content. ■

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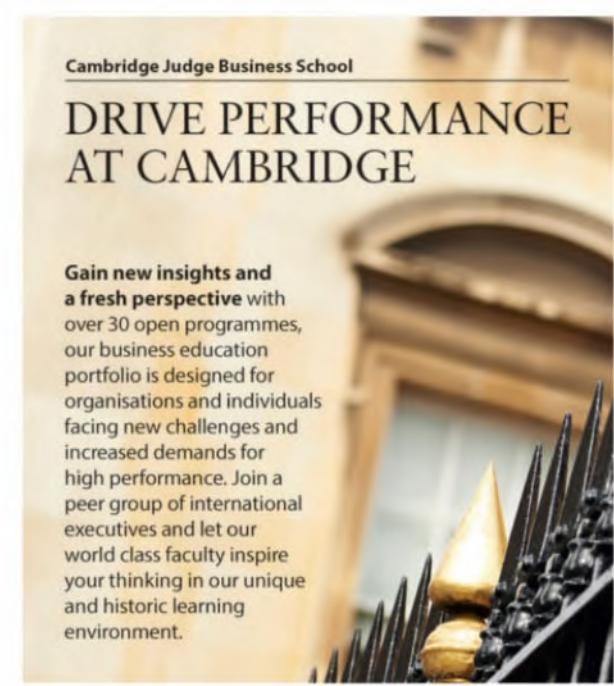
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Government of the Punjab, Livestock & Dairy Development Department Lahore (Pakistan) intends to purchase five (5) million doses of Foot & Mouth Disease (FMD) Vaccine from well reputed national/international firms. Sealed bids are invited in Pak Rupees from the interested contractor/firms with 2% (CDR) bid security of total bid cost. The bid should reach by 21-12-2015 at 11:00 AM which shall be opened at 11:30 AM on the same date in the presence of bidders who desire to participate in bid opening. Bidding document containing specification and detailed terms and conditions are available at <http://ppra.punjab.gov.pk> & www.livestockpunjab.gov.pk.

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Business & Personal

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The Economist November 28th 2015



International Restricted Service Tender

The Anna Lindh Euro-Mediterranean Foundation for the Dialogue between Cultures (ALF) – an inter-governmental organization co-funded by the EU and by the 42 governments of the Union for the Mediterranean (UfM) - launches the Contract Notice for the International Restricted Service Tender for the selection of a service provider that should carry out an opinion poll survey in 2016 and related data analysis in line with the objective of the ALF programme to publish the 3rd edition of the Anna Lindh Report on Intercultural Trends and Social Change in the Euro-Med region.

For further details, and to download the Contract Notice, please go to www.annalindhfoundation.org/tenders



fsdafrica

**CALL FOR EXPRESSIONS OF INTEREST
RESEARCH ON IMPACT OF EXECUTIVE EDUCATION**

FSDA is a non-profit company which promotes financial sector development across sub-Saharan Africa. It sees itself as a catalyst for change, working with partners to build financial markets that are robust, efficient and, above all, inclusive. It uses funding, research and technical expertise to identify market failures and strengthen the capacity of its partners to improve access to financial services and drive economic growth.

In the last 10 years, there has been a proliferation of executive education training courses in Africa. However, there has been limited research and analysis on the importance and impact of executive education, especially in the financial sector.

The main objective of this consultancy is to conduct research to develop an understanding of how middle and senior-level managers learn most effectively in executive education programmes and how these programmes benefit their organisations.

The scope of work will include:

- Carry out a study of current executive education offerings in general and those aimed at the financial sector
- Develop a conceptual framework and methodology for best practice in executive education
- Produce impact indicators by which executive education can be measured objectively

Your EOI should contain:

- Names and CVs (maximum 3 sides of A4 paper each) of lead consultant(s) including qualifications and relevant experience
- A short statement of why you believe your firm has the right experience and blend of expertise for this assignment
- A short description of anticipated risks and how you would expect to deal with these
- Confirmation of your firm's availability to carry out this work
- Any information that you believe should be taken into account in the shortlisting process

Please note - a fully costed proposal and/or detailed work plan is not required at this stage.

Your Expression of Interest which should not exceed 3 sides of A4 (font size 11), excluding CVs, company brochures etc. should be sent to info@fsdafrica.org under a subject line reading "Impact of Executive Education Research". The detailed EOI can be accessed through FSD Africa's website www.fsdafrica.org (call tab).

Proposals must be received by FSD Africa no later than 1200 (EAT) 14th December 2015

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Economic data

% change on year ago

	Gross domestic product	Industrial production	Consumer prices	Unemployment rate, %	Current-account balance	Budget balance	Interest rates, %	Currency units, per \$					
	latest	qtr*	2015†	latest	latest	2015†	latest 12 months, \$bn	% of GDP 2015†	% of GDP 2015†	10-year gov't bonds, latest	Nov 25th	year ago	
United States	+2.2 03	+2.1	+2.4	+0.3 Oct	+0.2 Oct	+0.3	5.0 Oct	-429.0 Q2	-2.5	-2.6	2.23	- -	
China	+6.9 03	+7.4	+6.9	+5.6 Oct	+1.3 Oct	+1.6	4.1 Q3§	+279.0 Q3	+3.1	-2.7	2.99§§	6.39	6.14
Japan	+1.0 03	-0.8	+0.7	-0.8 Sep	nil Sep	+0.7	3.4 Sep	+121.9 Sep	+2.7	-6.8	0.32	123	118
Britain	+2.3 03	+2.0	+2.5	+1.1 Sep	-0.1 Oct	+0.1	5.3 Aug††	-149.2 Q2	-4.6	-4.4	1.93	0.66	0.64
Canada	+1.0 02	-0.5	+1.2	+0.5 Aug	+1.0 Oct	+1.3	7.0 Oct	-48.5 Q2	-3.1	-1.8	1.59	1.33	1.13
Euro area	+1.6 03	+1.2	+1.5	+1.7 Sep	+0.1 Oct	+0.1	10.8 Sep	+348.8 Sep	+2.8	-2.1	0.47	0.94	0.80
Austria	+1.0 03	+2.2	+0.7	+0.3 Sep	+0.7 Oct	+0.9	5.7 Sep	+10.7 Q2	+1.2	-2.1	0.78	0.94	0.80
Belgium	+1.3 03	+0.8	+1.2	-2.4 Sep	+1.3 Oct	+0.5	8.7 Sep	-5.8 Jun	+1.2	-2.6	0.85	0.94	0.80
France	+1.2 03	+1.4	+1.1	+1.8 Sep	+0.1 Oct	+0.1	10.7 Sep	+0.2 Sep‡	-0.5	-4.1	0.85	0.94	0.80
Germany	+1.7 03	+1.3	+1.6	+0.2 Sep	+0.3 Oct	+0.2	6.4 Oct	+277.8 Sep	+7.8	+0.7	0.47	0.94	0.80
Greece	-0.1 03	-1.9	+0.5	+3.0 Sep	-0.9 Oct	-1.1	24.6 Aug	-2.8 Sep	+2.5	-4.1	7.31	0.94	0.80
Italy	+0.9 03	+0.8	+0.7	+1.7 Sep	+0.3 Oct	+0.1	11.8 Sep	+38.5 Sep	+2.0	-2.9	1.44	0.94	0.80
Netherlands	+1.9 03	+0.5	+2.0	+0.8 Sep	+0.7 Oct	+0.4	8.4 Oct	+85.3 Q2	+10.3	-1.8	0.66	0.94	0.80
Spain	+3.4 03	+3.2	+3.1	+4.0 Sep	-0.7 Oct	-0.5	21.6 Sep	+18.8 Aug	+0.8	-4.4	1.63	0.94	0.80
Czech Republic	+4.6 02	+2.0	+3.4	+0.6 Sep	+0.2 Oct	+0.3	5.9 Oct§	+2.4 Q2	-0.1	-1.8	0.60	25.5	22.1
Denmark	+2.0 02	+0.6	+1.7	+2.3 Sep	+0.4 Oct	+0.6	4.6 Sep	+22.7 Sep	+6.7	-2.9	0.75	7.04	5.96
Norway	+3.0 03	+7.3	+0.7	+3.3 Sep	+2.5 Oct	+1.7	4.6 Sep‡‡	+37.8 Q2	+9.3	+5.9	1.57	8.67	6.81
Poland	+3.6 02	+3.6	+3.4	+2.4 Oct	-0.7 Oct	nil	9.6 Oct§	-2.7 Sep	-1.4	-1.5	2.67	4.02	3.35
Russia	-4.1 03	na	-3.9	-3.4 Oct	+15.6 Oct	+15.0	5.5 Oct§	+64.3 Q3	+5.5	-2.8	9.66	65.6	45.8
Sweden	+3.3 02	+4.6	+3.0	+6.3 Sep	+0.1 Oct	nil	6.7 Oct§	+35.1 Q2	+6.5	-1.2	0.77	8.76	7.43
Switzerland	+1.2 02	+1.0	+0.9	-2.5 Q2	-1.4 Oct	-1.1	3.4 Oct	+60.9 Q2	+7.9	+0.2	-0.29	1.02	0.96
Turkey	+3.8 02	na	+2.9	-7.9 Sep	+7.6 Oct	+7.5	10.1 Aug§	-40.6 Sep	-4.9	-1.6	10.07	2.89	2.22
Australia	+2.0 02	+0.7	+2.3	+1.2 Q2	+1.5 Q3	+1.7	5.9 Oct	-47.4 Q2	-3.8	-2.4	2.88	1.38	1.17
Hong Kong	+2.3 03	+3.5	+2.4	-1.2 Q2	+2.4 Oct	+3.1	3.3 Oct‡‡	+7.4 Q2	+2.8	nil	1.62	7.75	7.75
India	+7.0 02	+6.6	+7.3	+3.6 Sep	+5.0 Oct	+5.0	4.9 2013	-25.9 Q2	-1.1	-3.8	7.70	66.4	61.9
Indonesia	+4.7 03	na	+4.7	+0.7 Sep	+6.2 Oct	+6.4	6.2 Q3§	-18.4 Q3	-2.5	-2.0	8.63	13,688	12,164
Malaysia	+4.7 03	na	+5.4	+5.1 Sep	+2.5 Oct	+2.5	3.2 Sep§	+7.8 Q3	+2.5	-4.0	4.18	4.21	3.35
Pakistan	+5.5 2015**	na	+5.7	+2.3 Sep	+1.6 Oct	+3.9	6.0 2014	-11.1 Q3	-0.7	-5.1	9.00†††	105	102
Philippines	+6.0 03	+4.5	+6.4	+3.6 Sep	+0.4 Oct	+2.4	6.5 Q3§	+11.7 Jun	+4.1	-1.9	4.08	47.0	45.0
Singapore	+1.9 03	+1.9	+2.9	-5.4 Oct	-0.8 Oct	+0.2	2.0 Q3	+68.6 Q3	+21.2	-0.7	2.51	1.41	1.30
South Korea	+2.7 03	+5.0	+2.4	+2.4 Sep	+0.9 Oct	+0.8	3.1 Oct§	+107.9 Sep	+8.0	+0.3	2.25	1,143	1,109
Taiwan	-1.0 03	+0.2	+3.2	-6.2 Oct	+0.3 Oct	+0.1	3.8 Oct	+77.2 Q3	+12.8	-1.0	1.14	32.5	30.9
Thailand	+2.9 03	+4.0	+3.4	-3.6 Sep	-0.8 Oct	+0.8	0.8 Sep§	+24.4 Q2	+2.4	-2.0	2.66	35.7	32.8
Argentina	+2.3 02	+2.0	+0.7	+0.2 Sep	— ***	—	5.9 Q3§	-8.3 Q2	-1.7	-3.6	na	9.68	8.52
Brazil	-2.6 02	-7.2	-2.8	-10.8 Sep	+9.9 Oct	+8.9	7.9 Oct§	-79.3 Sep	-3.8	-6.0	15.47	3.77	2.54
Chile	+2.2 03	+1.8	+2.8	+0.5 Sep	+4.0 Oct	+3.9	6.4 Sep‡‡	-2.7 Q3	-1.2	-2.2	4.55	713	598
Colombia	+3.0 02	+2.4	+3.3	+2.0 Sep	+5.9 Oct	+4.2	9.0 Sep§	-20.8 Q2	-6.7	-2.1	8.14	3,099	2,159
Mexico	+2.6 03	+3.0	+2.3	+1.7 Sep	+2.5 Oct	+2.9	4.2 Sep	-29.9 Q3	-2.7	-3.4	6.00	16.6	13.6
Venezuela	-2.3 03~	+10.0	-4.5	na	+68.5 Dec	+84.1	6.6 May§	+7.4 Q3~	-1.8	-16.5	10.51	6.31	6.35
Egypt	+4.3 04	na	+4.2	-5.5 Aug	+9.7 Oct	+10.0	12.8 Q3§	-12.2 Q2	-1.4	-11.0	na	7.83	7.15
Israel	+2.4 03	+2.5	+3.3	-4.5 Sep	-0.7 Oct	-0.2	5.3 Oct	+10.2 Q2	+4.9	-2.8	2.10	3.88	3.86
Saudi Arabia	+3.5 2014	na	+2.7	na	+2.4 Oct	+2.7	5.7 2014	-1.5 Q2	-2.7	-12.7	na	3.76	3.75
South Africa	+1.0 03	+0.7	+1.5	+0.4 Sep	+4.7 Oct	+4.7	25.5 Q3§	-15.6 Q2	-4.3	-3.8	8.46	14.2	10.9

Source: Haver Analytics. *% change on previous quarter, annual rate. †The Economist poll or Economist Intelligence Unit estimate/forecast. §Not seasonally adjusted. ‡New series. ~2014 **Year ending June. §§Latest 3 months. ††3-month moving average. §§5-year yield. ***Official number not yet proven to be reliable; The State Street PriceStats Inflation Index, August 27.01%; year ago 38.49% ††Dollar-denominated



Markets

	Index Nov 25th	% change on			
		one week	Dec 31st 2014 in local currency terms	in local currency terms	in \$
United States (DJIA)	17,813.4	+0.4	-0.1	-0.1	
China (SSEA)	3,820.1	+2.2	+12.7	+9.4	
Japan (Nikkei 225)	19,847.6	+1.0	+13.7	+11.0	
Britain (FTSE 100)	6,337.6	+0.9	-3.5	-6.7	
Canada (S&P TSX)	13,403.4	nil	-8.4	-20.3	
Euro area (FTSE Euro 100)	1,153.1	+0.8	+11.2	-2.6	
Euro area (EURO STOXX 50)	3,462.1	+0.9	+10.0	-3.6	
Austria (ATX)	2,441.0	-1.0	+13.0	-1.0	
Belgium (Bel 20)	3,708.7	+0.7	+12.9	-1.1	
France (CAC 40)	4,893.0	-0.3	+14.5	+0.3	
Germany (DAX)*	11,169.5	+1.9	+13.9	-0.2	
Greece (Athex Comp)	642.8	-4.3	-22.2	-31.8	
Italy (FTSE MIB)	22,359.2	+1.2	+17.6	+3.0	
Netherlands (AEX)	468.1	+0.5	+10.3	-3.4	
Spain (Madrid SE)	1,032.1	-0.3	-1.0	-13.3	
Czech Republic (PX)	975.7	-1.7	+3.1	-7.4	
Denmark (OMXCB)	887.8	+0.7	+31.5	+15.0	
Hungary (BUX)	23,610.6	+1.4	+41.9	+25.7	
Norway (OSEAX)	665.2	-0.5	+7.3	-7.1	
Poland (WIG)	47,945.3	-2.8	-6.8	-17.7	
Russia (RTS, \$ terms)	878.9	+0.3	+21.6	+11.2	
Sweden (OMX30)	1,506.5	-0.5	+2.9	-8.1	
Switzerland (SMI)	8,934.5	-0.6	-0.5	-3.5	
Turkey (BIST)	76,836.5	-4.6	-10.4	-27.4	
Australia (All Ord.)	5,245.1	+1.1	-2.7	-13.6	
Hong Kong (Hang Seng)	22,498.0	+1.4	-4.7	-4.6	
India (BSE)	25,775.7	+1.2	-6.3	-10.8	
Indonesia (JSX)	4,585.5	+1.9	-12.3	-20.6	
Malaysia (KLCSE)	1,684.4	+1.7	-4.4	-20.6	
Pakistan (KSE)	33,199.9	-2.2	+3.3	-1.5	
Singapore (STI)	2,891.6	+0.2	-14.1	-19.1	
South Korea (KOSPI)	2,009.4	+2.4	+4.9	+0.8	
Taiwan (TWI)	8,386.1	+0.5	-9.9	-12.4	
Thailand (SET)	1,381.5	+0.3	-7.8	-15.0	
Argentina (MERV)	12,849.6	-6.7	+49.8	+31.0	
Brazil (BVSP)	46,866.6	-1.2	-6.3	-33.9	
Chile (IGPA)	18,480.3	-0.1	-2.1	-16.7	
Colombia (IGBC)	8,375.6	-1.5	-28.0	-44.8	
Mexico (IPC)	44,138.8	-0.8	+2.3	-9.0	
Venezuela (IBC)	13,098.5	+5.1	+239	na	
Egypt (Case 30)	6,391.1	-0.4	-28.4	-34.6	
Israel (TA-100)	1,346.9	-0.9	+4.5	+4.8	
Saudi Arabia (Tadawul)	7,208.4	+3.7	-13.5	-13.6	
South Africa (JSE AS)	51,914.6	+0.5	+4.3	-14.8	

Growth in Asia

Growth in emerging Asia will remain healthy in the coming five years, according to the OECD, a think-tank, which forecasts an average rate of 6.2% a year in 2016-20. Although that is below the 7% figure posted in 2011-13, thanks mainly to the effects of China's slowing growth, there are some bright spots. Thailand is forecast to recover from the political turmoil that hit growth in 2014; tourist arrivals into the country have increased since then. Although low oil revenues have hit Brunei hard, a projected rise in the oil price will help its economy along. Cambodia and Laos will post some of the highest levels of growth in the region, because of recovery in both countries' agricultural sectors.

GDP forecasts, % change on a year earlier



Source: OECD

*Annual average

Other markets

	Index Nov 25th	% change on			
		one week	Dec 31st 2014 in local currency terms	in local currency terms	in \$
United States (S&P 500)	2,088.9	+0.3	+1.5	+1.5	
United States (NAScomp)	5,116.1	+0.8	+8.0	+8.0	
China (SSEB, \$ terms)	384.8	+3.0	+36.3	+32.3	
Japan (Topix)	1,594.7	+0.5	+13.3	+10.5	
Europe (FTSEurofirst 300)	1,502.5	+0.4	+9.8	-3.8	
World, dev'd (MSCI)	1,697.8	+0.4	-0.7	-0.7	
Emerging markets (MSCI)	836.2	+1.6	-12.6	-12.6	
World, all (MSCI)	409.0	+0.5	-2.0	-2.0	
World bonds (Citigroup)	863.5	+0.3	-4.3	-4.3	
EMBI+ (JP Morgan)	717.1	+0.3	+3.7	+3.7	
Hedge funds (HFRX)	1,188.2 [§]	-0.2	-2.5	-2.5	
Volatility, US (VIX)	15.2	+16.9	+19.2	(levels)	
CDSs, Eur (iTRAXX) [†]	70.5	+0.3	+11.9	-1.9	
CDSs, N Am (CDX) [†]	84.6	+3.3	+27.9	+27.9	
Carbon trading (EU ETS) €	8.6	+0.6	+18.2	+3.6	

Sources: Markit; Thomson Reuters. *Total return index.

†Credit-default-swap spreads, basis points. [§]Nov 24th.

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

The Economist commodity-price index

	Nov 17th	Nov 24th*	% change on	
			one month	one year
Dollar Index				
All Items	126.5	125.5	-4.0	-20.9
Food	148.8	149.0	-1.9	-15.5
Industrials				
All	103.3	101.0	-7.0	-27.9
Nfa [†]	107.7	107.5	-1.2	-14.4
Metals	101.4	98.2	-9.5	-32.9
Sterling Index				
All items	151.2	151.5	-2.4	-17.5
Euro Index				
All items	147.6	146.6	-0.3	-7.2
Gold				
\$ per oz	1,075.1	1,074.9	-7.9	-10.3
West Texas Intermediate				
\$ per barrel	40.7	41.4	-4.2	-44.0

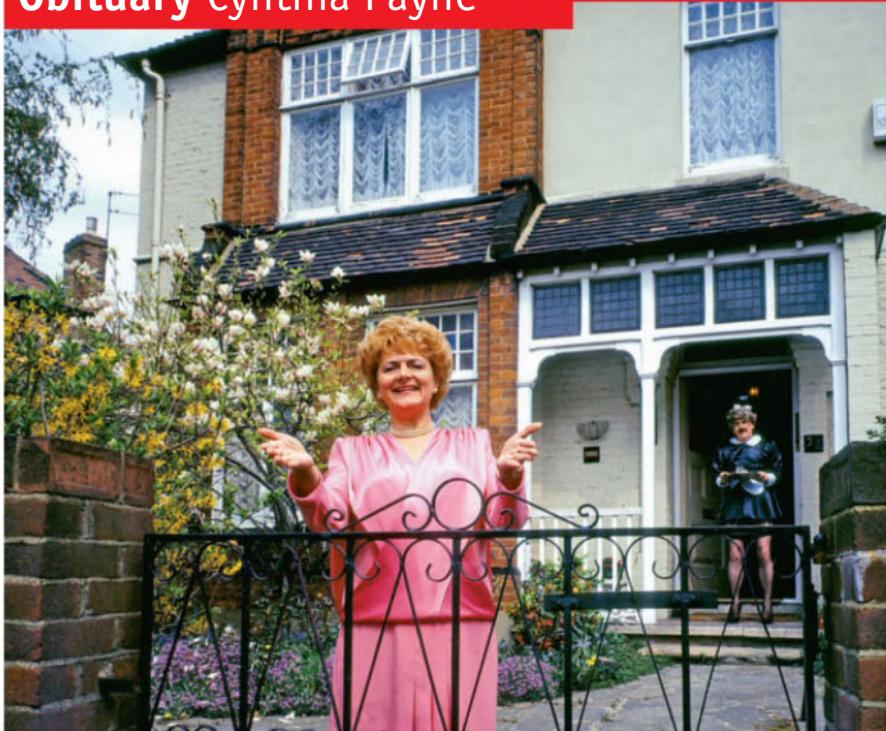
Sources: Bloomberg; CME Group; Cottlook; Darmenn & Curl; FT; ICCO; ICO; ISO; Live Rice Index; LME; NZ Wool Services; Thompson Lloyd & Ewart; Thomson Reuters; Urner Barry; WSJ. *Provisional

[†]Non-food agriculturals.**EPISODE THREE****HEALTH WITHOUT WEALTH**

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Sex in Streatham

Cynthia Payne, brothel-keeper and exposer of Britain's sexual hypocrisies, died on November 15th, aged 82

NUMBER 32 Ambleside Avenue, London SW16, could not have looked more respectable, or more right for Cynthia Payne. A detached Edwardian house, double-fronted, four-bed, with a wooden porch and bluebells in the garden. Lovely inside, too, once she'd had her way with it, with thick carpets, antimacassars on the sofas, scalloped nets at the windows and flowery china in the cupboards. It was the ideal place, in short, to conduct her business from 1974 onwards. So ideal that, as the police said in 1980 when she was sentenced to 18 months in jail, 32 Ambleside Avenue was the biggest "disorderly house" run in Britain for more than 200 years.

That made her proud, though it was not disorderly by a long shot. Hers was a high-class establishment. The clients at her afternoon "parties" were all over 40: no yobs or Jack-the-lads boasting about their equipment, but men with perfect manners, in suits, who would drink sherry and partake of a cheese-and-ham roll before going up to the bedrooms. Moreover, they included—as the police found when, just before Christmas in 1978, they kicked her nice front door down—vicars, barristers, bankers, an MP and "a peer of the realm". The 53 men, many in lingerie and some *in flagrante*, got off scot-free; the 13 girls fled; Mrs Payne went to Holloway, which wasn't

pleasant. Her ordeal and her defiance of Britain's hypocritical prostitution laws entertained the country for years.

According to the law she was running a brothel and controlling prostitutes, both criminal offences. According to herself, in her cheery surf-London tones, she was providing an essential social service. Nine times out of ten, if men didn't get the sort of sex they needed, they became irritable or squiffy, or even violent. Her parties calmed them down in the time-honoured fashion and, for the old and lonely, gave them back their confidence in the arms of a lovely girl. (Pensioners got a special discount and, to restore their energy afterwards, mugs of beef extract.) In Ambleside Avenue the immaculate cleaning and decorating were done, often naked and in deep contentment, by Slave Rodney and Slave Philip, married men whose wives did not humiliate them enough; and tea might be served by ex-Squadron Leader Robert "Mitch" Mitchell Smith, her devoted friend (in the porch, above), sporting his RAF moustache but dressed as a French maid.

Taking money for sex, she stoutly said, was no different from a private doctor charging for half an hour of his time. In fact, sex was very good value compared, and probably did the job quicker. She didn't exactly charge, in any case. She sold old lun-

cheon vouchers for £25 each, which barely covered the buffet and unlimited drinks and could also be exchanged upstairs; but there the clients made their own arrangements with the girls, who later redeemed the vouchers for £10 each. (Incidentally, she looked after her girls, who had to be willing and usually did it for laughs anyway, and would cook them poached eggs on toast when they had finished work for the day.) Since her luncheon-voucher sales were "immoral earnings", the Inland Revenue was bound to make a virtuous show of not wanting to extract the tax—but then presented her, as she left prison, with a back-bill for £236,000.

The man from Margate

In Ambleside Avenue, smiling and bossy in low-bosomed satin gowns, she was part-Madame (Madame Cyn, indeed), part-matriarch, but seldom joined in herself. That was mostly because she was past it, of course, and too busy brewing the tea. It was also because, for all her light and merry talk about sex, flashing her knickers in the bus station or dancing naked on the garden shed, her own sexual history had been tough. Since her teenage years in the louche, faded towns of the south coast, she had liked male company far too much to discriminate, with disastrous results. One lover drank too much. Another, from an amusement arcade in Margate, refused to wear a condom, leading to three illegal abortions. She ended up with one son fostered, one stillborn, another given up for adoption—and no flaming bloody passion with any of the men. In her 30s she briefly went on the game herself, lying there like a log and miserable, to pay for her first son's education. Better to rent a nice premises and let other girls use it; or, with Mitch's help, just buy a big house and give the most wonderful parties there.

The prison sentence interrupted them only for a time. By the mid-80s everything was in full swing again, until a second arrest and trial in 1986. At that point, though she was cleared, she decided to go into politics instead, standing as a candidate for her own Payne and Pleasure Party in Kensington in 1988 and Streatham in 1992. Not many votes came her way, but it didn't matter, for dozens of MPs had already joined her fight to get brothel-keeping decriminalised. They failed; it remains illegal in Britain, though prostitution is not, and on the streets, at least, criminality now lies with customers rather than providers.

Decriminalisation was all Mrs Payne wanted; not legalisation, which would have stifled the free enterprise she so enjoyed. And as one of her party guests, an ex-chief superintendent of the Metropolitan Police, once told her, there would be no problem with decriminalisation, if all the houses of disorder were as nice as hers. ■

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