

The
Economist

JUNE 11TH-17TH 2016

Britain leans towards Brexit

South Korea: no place for working women

Waging war on potholes

Speech therapy for central bankers

Goodbye to the Greatest

How to make a good teacher



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What matters in schools is teachers. Fortunately, teaching can be taught: leader, page 13. Great teaching has long been seen as an innate skill. But reformers are showing that the best teachers are made, not born, pages 24-26

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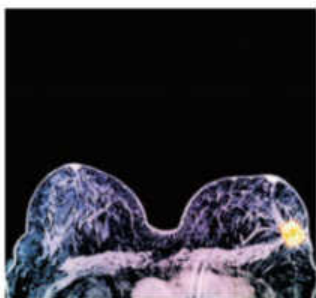


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Politics



Hillary Clinton claimed the Democratic nomination for president after winning four more states. In California, the biggest prize of all, she walloped Bernie Sanders, her rival, by 56% to 43%. Before the primaries the Associated Press estimated that she had secured enough support from superdelegates—party politicians and bigwigs—to push her over the finishing line.

Donald Trump, the Republican candidate, said that a judge overseeing a civil-fraud case against the now defunct

Trump University would not give him a fair hearing because he was of Mexican descent. Paul Ryan, the Speaker of the House of Representatives, who only recently and somewhat reluctantly threw his support behind Mr Trump, described it as a “textbook definition of a racist comment”.

Power surge

Cabinet officials from America and **China** held talks in Beijing. China agreed to cut steel output, co-operate on combating climate change and enforce sanctions on North Korea aimed at persuading it to abandon its nuclear-weapons programme. Big differences remained, however, not least over China’s territorial ambitions in the South China Sea.

Hundreds of **lawyers** in China signed a statement condemning police for allegedly attacking one of their peers in a court in the southern city of Nanning. The city’s government denied the allegation, but ordered the court to apologise and pay compensation.

In **Hong Kong** thousands of people attended an annual vigil to commemorate the crushing of the Tiananmen Square protests in Beijing in 1989. Some student groups, which had joined previous vigils, stayed away, saying they preferred to focus on democratic reform in Hong Kong.

At least 19 people were killed in attacks on an army base, checkpoint and gun shops in Aktobe, in north-western **Kazakhstan**. Islamic militants were blamed.

Tax-free threshold

Saudi Arabia’s government published more details of its plans to reduce the country’s budget deficit and rebalance the economy away from oil. It alarmed the country’s 10m expats by suggesting it might impose an income tax on them, though it ruled out taxing its own 20m nationals.

The UN warned that up to 90,000 civilians could be trapped inside Fallujah, a city near Baghdad held by Islamic

State that **Iraqi** forces are trying to retake. IS has fired on residents trying to flee.

Two Palestinian gunmen opened fire in a restaurant in **Tel Aviv**, killing four people. A wave of violence against Israelis that has lasted for over a year had only recently started to abate. The government suspended entry permits for Palestinians from Gaza and the West Bank.

South Africa’s economy contracted by an annualised 1.2% in the first three months of 2016, a far steeper fall than had been forecast by economists. The slumping economy will add to pressure on the ruling African National Congress in local elections in August.

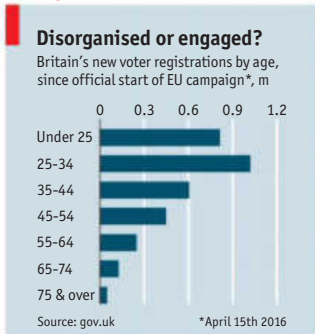
Militants in **Nigeria’s** oil-producing regions attacked pipelines and oil wells, reducing the country’s oil output to its lowest level in nearly three decades. A militant group, calling itself the Niger Delta Avengers, started the attacks after the government stopped



▶ paying such groups to protect pipelines.

At least 18 people with albinism have been killed in **Malawi** since the end of 2014, according to Amnesty International. The victims are thought to have been murdered because of a false belief that their body parts have magical properties.

D-Day is June 23rd



Britain's prime minister, David Cameron, and the leader of the anti-European UKIP, Nigel Farage, represented each side of the Brexit campaign in a tv debate. Immigration was a big issue for the audience, as

was the economy. The Electoral Commission extended the deadline for voter registration after a surge in applications caused its website to crash. Over half a million people applied on the final day. Encouragingly for Mr Cameron and the Remainers, registrations among under-35-year-olds, a group that polls show are strongly pro-EU, accounted for most of the demand.

A car bomb in Istanbul, targeting a police bus, killed 11 people, the fourth bomb attack in **Turkey's** largest city this year. No group claimed responsibility for the incident, but Turkey's president, Recep Tayyip Erdogan, suggested the outlawed Kurdistan Workers' Party was to blame.

Swiss voters rejected a plan to bring in a universal basic income; only 23% were in favour. The bill proposed giving each adult SFr2,500 (\$2,560) per month unconditionally. Finland and the Netherlands are considering similar programmes.

Germany's president, Joachim Gauck, announced that he will not run for re-election next year because at 76 he is too old. His decision will make the political landscape even more complicated for Angela Merkel, the chancellor, who has struggled to rally support for her open-doors refugee policy.

The EU's popularity is in decline, according to a survey from Pew. In almost all of the ten countries covered, enthusiasm for the **European project** has waned. Despite the forthcoming Brexit vote, it is French opinions, not British, that have turned most sharply. Only 38% of French people view the EU favourably now, compared with 69% in 2004.

Dead voters walking
Haiti's electoral council scrapped the results of last year's first round of voting in the presidential election and set a new date for elections on October 9th. It said it had uncovered widespread fraud, including the use of "zombie votes". The interim president,

Jocelerme Privert, said he would stay in power until a run-off is held in January, which means he will be in office six months past his parliamentary mandate.



In **Peru's** presidential election, Pedro Pablo Kuczynski seemed to have defeated Keiko Fujimori by just 39,000 votes out of the 18m cast. Ms Fujimori, whose father, Alberto, was president from 1990 to 2000, had led the opinion polls for months. Mr Kuczynski is a 77-year-old liberal economist who wants to stimulate the economy through tax cuts and investment, particularly in sanitation and health care.



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Business



Janet Yellen, the chairman of the **Federal Reserve**, dropped a strong hint that the central bank won't raise interest rates at its June meeting, a reversal of previous indications that it would. After figures showed that only 38,000 new jobs were created in May, Ms Yellen said in a speech that current monetary policy is "generally appropriate" and omitted to mention that rates will rise "in the coming months", a phrase that Fed-watchers interpret as a sure sign of an impending increase.

In a surprise move the **Bank of Korea** cut its benchmark interest rate for the first time in a year, to a record low of 1.25%. South Korea's export-led economy is reeling from the slowdown in China. Along with the government the central bank is pumping \$9.5 billion into state-run development banks that have run up big losses from loans to the weakened shipbuilding industry.

A long player

In a long-running legal saga **Guy Hands**, the founder of Terra Firma Capital Partners, went back to court to resume his fight with **Citigroup** over the advice its British arm gave to him in the calamitous buy-out of **EMI** in 2007. Citi eventually seized control of the record label to recoup loans it had made to finance the bid. Mr Hands claims the bank's guidance on the deal was misleading. A jury in New York sided with Citi in 2010, but that verdict was reversed on appeal. The next chapter in the case is being heard by a judge in London.

A labour tribunal in France ordered **Société Générale** to compensate **Jérôme Kerviel**, a rogue trader at the French bank, €450,000 (\$512,000) because he was sacked without "real or serious cause". Mr Kerviel lost the French bank €4.9 billion through his dodgy trades and was found guilty in 2010, a conviction that was upheld on appeal. SocGen said the tribunal's decision was "incomprehensible".

After talks in Beijing with American Treasury officials, the Chinese government announced plans to make it easier and cheaper for businesses in the United States to **invest in China** using the yuan. The proposal gives America a quota of up to 250 billion yuan (\$38 billion) to invest in Chinese shares and bonds. China hopes to boost foreign investment in the country after last year's stock-market meltdown dented confidence.

The **European Central Bank** (ECB) started adding corporate bonds to the debt it is buying through its quantitative-easing programme, a policy change that was announced in March. Meanwhile, the yield on German ten-year government bonds dropped to a new low

of 0.035% and threatened to fall into negative territory.

The ECB reported that none of the seven EU states that are supposed eventually to adopt the **euro**—Bulgaria, the Czech Republic, Croatia, Hungary, Poland, Romania and Sweden—is on track to do so. Given the euro zone's problems, that is probably because they would rather not join at the moment.

Needs some strong medicine

Bogged down in federal investigations into its business practices, **Valeant** reported a quarterly loss of \$374m and reduced its profit forecast for the year. The drugmaker also disclosed that it is selling some of its products at a loss. Its share price, which has been hammered over the past year, fell by a further 14%.

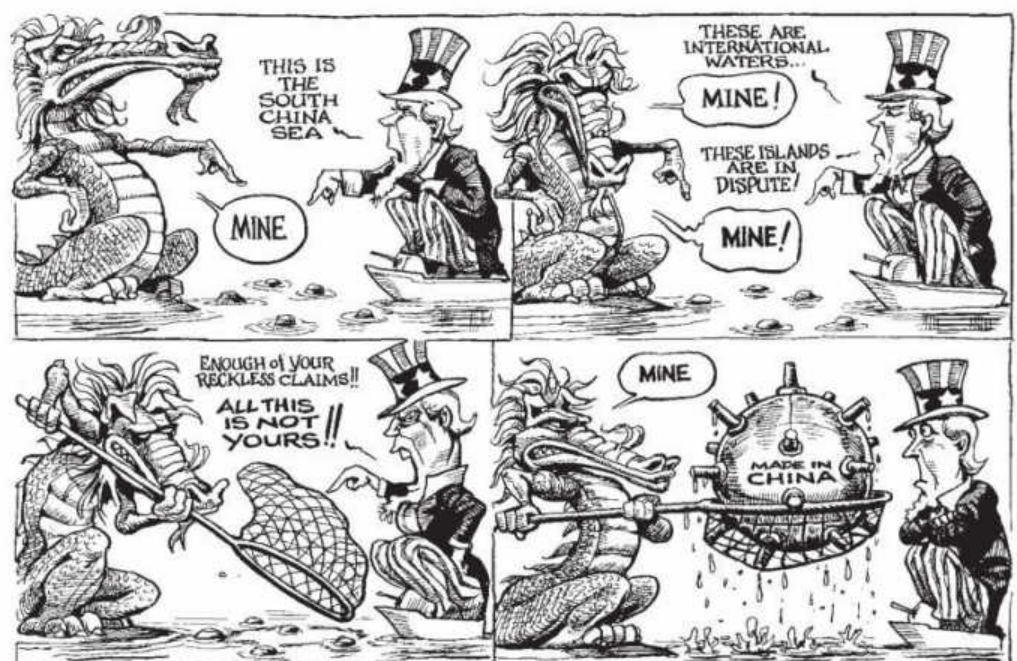
A few days after its chief executive quit, **Noble Group**, Asia's biggest commodities-trading firm, announced that Richard Elman would step down as chairman. The company, which has been hit hard by the slump in commodity prices, also announced a new \$500m rights issue, which unnerved investors already worried about its ability to tap banks for loans.

A few days after the collapse of **British Home Stores**, a committee in Parliament grilled Dominic Chappell, the retail chain's former owner, and Darren Topp, a former chief executive. The committee is investigating what led to the bankruptcy. BHS's debt of more than £1 billion (\$1.5 billion), half of which is a pension shortfall, crippled the business. In startling revelations Mr Chappell was accused of having "his fingers in the till" and threatening, on more than one occasion, to kill Mr Topp (Mr Chappell denied this). Up to 11,000 jobs and 163 stores will go as a result of BHS's demise.

The new bogeymen

In a bad PR week for British retailing, Mike Ashley, the boss of **Sports Direct** and a one-time suitor of BHS, was also hauled in front of MPs. He was questioned, among other things, about an alleged culture of fear at the firm's main warehouse. Unions told the committee that an employee gave birth in the toilet rather than miss a day's work for fear of being disciplined. Mr Ashley conceded that he wouldn't want his family to work there.

Other economic data and news can be found on pages 88-89





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How to make a good teacher

What matters in schools is teachers. Fortunately, teaching can be taught



FORGET smart uniforms and small classes. The secret to stellar grades and thriving students is teachers. One American study found that in a single year's teaching the top 10% of teachers impart three times as much learning to their pupils as the worst 10% do. Another suggests that, if black pupils were taught by the best quarter of teachers, the gap between their achievement and that of white pupils would disappear.

But efforts to ensure that every teacher can teach are hobbled by the tenacious myth that good teachers are born, not made. Classroom heroes like Robin Williams in "Dead Poets Society" or Michelle Pfeiffer in "Dangerous Minds" are endowed with exceptional, innate inspirational powers. Government policies, which often start from the same assumption, seek to raise teaching standards by attracting high-flying graduates to join the profession and prodding bad teachers to leave. Teachers' unions, meanwhile, insist that if only their members were set free from central diktat, excellence would follow.

The premise that teaching ability is something you either have or don't is mistaken. A new breed of teacher-trainers is founding a rigorous science of pedagogy. The aim is to make ordinary teachers great, just as sports coaches help athletes of all abilities to improve their personal best (see pages 24-26). Done right, this will revolutionise schools and change lives.

Quis docebit ipsos doctores?

Education has a history of lurching from one miracle solution to the next. The best of them even do some good. Teach for America, and the dozens of organisations it has inspired in other countries, have brought ambitious, energetic new graduates into the profession. And dismissing teachers for bad performance has boosted results in Washington, DC, and elsewhere. But each approach has its limits. Teaching is a mass profession: it cannot grab all the top graduates, year after year. When poor teachers are fired, new ones are needed—and they will have been trained in the very same system that failed to make fine teachers out of their predecessors.

By contrast, the idea of improving the average teacher could revolutionise the entire profession. Around the world, few teachers are well enough prepared before being let loose on children. In poor countries many get little training of any kind. A recent report found 31 countries in which more than a quarter of primary-school teachers had not reached (minimal) national standards. In rich countries the problem is more subtle. Teachers qualify following a long, specialised course. This will often involve airy discussions of theory—on ecopedagogy, possibly, or conscientisation (don't ask). Some of these courses, including masters degrees in education, have no effect on how well their graduates' pupils end up being taught.

What teachers fail to learn in universities and teacher-training colleges they rarely pick up on the job. They become better teachers in their first few years as they get to grips with real pu-

pils in real classrooms, but after that improvements tail off. This is largely because schools neglect their most important pupils: teachers themselves. Across the OECD club of mostly rich countries, two-fifths of teachers say they have never had a chance to learn by sitting in on another teacher's lessons; nor have they been asked to give feedback on their peers.

Those who can, learn

If this is to change, teachers need to learn how to impart knowledge and prepare young minds to receive and retain it. Good teachers set clear goals, enforce high standards of behaviour and manage their lesson time wisely. They use tried-and-tested instructional techniques to ensure that all the brains are working all of the time, for example asking questions in the classroom with "cold calling" rather than relying on the same eager pupils to put up their hands.

Instilling these techniques is easier said than done. With teaching as with other complex skills, the route to mastery is not abstruse theory but intense, guided practice grounded in subject-matter knowledge and pedagogical methods. Trainees should spend more time in the classroom. The places where pupils do best, for example Finland, Singapore and Shanghai, put novice teachers through a demanding apprenticeship. In America high-performing charter schools teach trainees in the classroom and bring them on with coaching and feedback.

Teacher-training institutions need to be more rigorous—rather as a century ago medical schools raised the calibre of doctors by introducing systematic curriculums and providing clinical experience. It is essential that teacher-training colleges start to collect and publish data on how their graduates perform in the classroom. Courses that produce teachers who go on to do little or nothing to improve their pupils' learning should not receive subsidies or see their graduates become teachers. They would then have to improve to survive.

Big changes are needed in schools, too, to ensure that teachers improve throughout their careers. Instructors in the best ones hone their craft through observation and coaching. They accept critical feedback—which their unions should not resist, but welcome as only proper for people doing such an important job. The best head teachers hold novices' hands by, say, giving them high-quality lesson plans and arranging for more experienced teachers to cover for them when they need time for further study and practice.

Money is less important than you might think. Teachers in top-of-the-class Finland, for example, earn about the OECD average. But ensuring that the best stay in the classroom will probably, in most places, mean paying more. People who thrive in front of pupils should not have to become managers to earn a pay rise. And more flexibility on salaries would make it easier to attract the best teachers to the worst schools.

Improving the quality of the average teacher would raise the profession's prestige, setting up a virtuous cycle in which more talented graduates clamoured to join it. But the biggest gains will come from preparing new teachers better, and upgrading the ones already in classrooms. The lesson is clear; it now just needs to be taught. ■

Brexit

Jeremy Corbyn, saboteur

Lacklustre and poorly led, the Labour Party is letting down the Remain campaign



IN 1975 a Labour government, split on Britain's membership of the European Economic Community (as it then was), put the matter to a referendum. Most of its supporters wanted to leave, so it fell to the pro-European Conservatives to trumpet the case for staying. Margaret Thatcher, their leader, campaigned in a hideous sweater bespangled with European flags and railed against "the parochial politics of 'minding our own business'". On the day, two-thirds of Britons voted to remain.

The intervening decades have reversed the politics. The party of David Cameron, the Tory prime minister, is now deeply divided on Europe, so to win the referendum on June 23rd he needs the pro-Remain Labour Party to beat the drum.

Yet with polls narrowing—as we went to press five of the most recent eight had put Leave ahead (see page 60)—it is failing to do so. Jeremy Corbyn, its leader, is no Thatcher. Hailing from the rump of the old Eurosceptic left, he sees the EU as a capitalist conspiracy. He voted to leave in 1975 and probably would again if Labour's pro-EU MPs and supporters let him.

Mr Corbyn did not make his first pro-EU intervention until mid-April, fully two months after Mr Cameron called the referendum. Since then he has been a bit player at best. When researchers at Loughborough University ranked the ten most reported-on politicians in the second half of May, he did not even make the list (partly by his own design: he had spent part of the period on holiday). By refusing to campaign alongside Tories—doing so would "discredit" the party, sniffs John McDonnell, his shadow chancellor—he has ruled himself out of every important Remain event and televised debate.

When Mr Corbyn does bother to intervene, he is a study in reluctance. His "pro-EU" speeches are litanies of complaints

about the union. Voters should back Remain, he says, because the Conservatives would not negotiate the right sort of Brexit. On June 2nd he declared Treasury warnings about the consequences of leaving as "hysterical hype" and "mythmaking".

No wonder that few Labour figures are taking it upon themselves to speak up. The most prominent campaigners are not MPs at all but two big faces from the party's past: Tony Blair and Gordon Brown. And even they were absent from the Loughborough list. Following Mr Corbyn's lead, the party is on autopilot: in an economics briefing circulated to its MPs on June 6th, the risk of Brexit was point number 16.

Stand up and be counted

This is feckless. The choice Britain faces on June 23rd will have profound consequences, not least for Labour voters poorly placed to weather a post-Brexit recession. Yet just 52% of Labour supporters say that they will vote, compared with 69% of Tories. Little more than half of them even know that their party is for staying in the EU.

The consequence could be that Britain votes to quit. Most Tory voters want to leave, and Mr Cameron is ill-placed to woo young and working-class voters. Labour MPs confess shock at the Euroscepticism the referendum has uncovered in the party's heartlands.

Perhaps Mr Corbyn simply cannot inspire his party and the struggle to uphold the status quo does not interest him. Or perhaps he is deliberately sabotaging the Remain campaign. If Britain left, the Conservative Party could tear itself apart. If there were a snap election, he might stand a chance of forming a Labour government. Yet to treat the future of the country as a question of transient advantage would be shockingly shallow.

Whether born of apathy or ambition, Mr Corbyn's behaviour does him no credit. If Britain does vote to leave, it will need a strong opposition leader. Sadly, it will not have one. ■

Fund management

Slow-motion revolution

The rise of low-cost managers like Vanguard should be celebrated



portfolios for retail investors at a fraction of the cost of the industry average, thanks in part to a mutually owned structure that means it cuts fees rather than pays dividends. It now runs more than \$3.5 trillion of assets, and takes in another \$1 billion or so from investors every working day.

IN THE past few years, industries including retailing, music and taxis have been spectacularly blown apart by low-cost innovators. Less celebrated is Vanguard, a fund-management group that also fits the disruptive mould. It offers diversified

This is no overnight success: Vanguard was founded in the 1970s. That such a superior model has taken 40 years to reach today's position is testament to two failings of finance (see page 71). One lies in incentives in the industry. Many products are sold by brokers or investment advisers and, for a long time, the salesforce was paid by commission. Vanguard does not pay commission, so the business went elsewhere.

The second failing is investors' fault. Most of Vanguard's funds are "passive". They do nothing more than try to match their benchmark (an index like the S&P 500, say). When this idea was first mooted, people scoffed. Who would settle for mediocrity? Better to pick one of the star "active" managers with a record of beating the market. The law of averages does ►►

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▶ indeed suggest that some managers outperform. But though you can spot such titans in retrospect, it is hard in advance. Otherwise, why would anyone give money to the also-rans?

Regulators have belatedly tackled the incentives problem by requiring advisers to be paid by fees, rather than commissions. And an era of low interest rates and low returns has made investors more aware of the damage from charges. Too many savers have suffered the drip-drip of fees on their long-term returns in the vain pursuit of outperformance—money for old hope. A 25-year-old saver who invests in a pension for 40 years on an annual charge of 1% will take a 25% hit on the average dollar deposited in their pot, irrespective of returns; for those who pay 1.5% a year, the loss is 38%. The total fees on the average Vanguard tracker are 0.08% a year.

Money is gushing into passive funds. In America they raked in \$400 billion in 2015; actively managed funds endured outflows. Because of economies of scale, it costs little more to run a \$10 billion index fund than to manage a pot of \$1 billion.

Are there risks from the disruption of fund management? Critics of big tracker managers like Vanguard and BlackRock argue they make financial markets more volatile. In theory, tracker funds could lead to swings as investors pile in and out of all shares simultaneously. But the evidence that retail investors withdraw *en masse* from tracker funds when the market falls is thin—they did not during the financial crisis. And new types of tracker funds are emerging that invest in stocks based on different criteria such as dividend yield; that should reduce the tendency to herd.

Another worry is that tracker managers will be less vigilant

in rooting out bad management practices at the firms they invest in, as they do not have the option of selling if they are unhappy. It is true that passive funds could do more to hold companies in their portfolios to account (even if more vigilant governance adds a small cost). But problems of inadequate governance afflict active managers as well as passive ones.

A third—somewhat contradictory—concern is that a stock-market dominated by tracker managers would lead to collusion. As such funds grow, they take big ownership positions in firms that compete with each other. Vanguard owns 5% of American stocks, for example; it is among the top three shareholders in the four biggest banks in America. If firms share a large shareholder, they might feel less obliged to compete. But trackers do not seek to attract investment by boosting their returns, unlike actively managed funds. As a result, they have less reason to encourage collusion.

The trackers of my tears

If passive funds go from accounting for roughly 30% of global stockmarkets to, say, 70-80%, then some of these worries would have more bite. But that will take a long time; despite the surge of money into passive funds, the share of actively managed stocks has only fallen from 78% to 70% in the past six years. For the foreseeable future any risks from tracker funds are far outweighed by their ability to offer cheap, diversified funds to retail investors. The real problem is not the rise of Vanguard and the other tracker funds; it is the rotten deal that retail investors have received from the fund-management industry for far too long. ■

Agricultural technology

Feeding the ten billion

Growing enough food for future generations will be a challenge. Here's how to meet it



ONE of the extraordinary things about the modern world is that so much of it takes food for granted. For most of recorded history, the struggle to eat has been the main focus of human activity, and all but a handful of people were either farmers or farm workers. Starvation was an ever-present threat. Even the best years rarely yielded much of a surplus to carry over as an insurance against leaner times. In the worst, none but the powerful could be sure of a full stomach.

Now most people in rich countries never have to worry about where the next meal is coming from. In 1900 two in every five American workers laboured on a farm; now one in 50 does. Even in poor places such as India, where famine still struck until the mid-20th century, the assumption that everyone will have something to eat is increasingly built into the rhythm of life.

That assumption, though, leads to complacency. Famine has ended in much of the world, but it still stalks parts of Africa—Ethiopia, Mozambique and Zimbabwe, to name three, depend on handouts of food. And millions of people still suffer from famine's lesser cousin, malnutrition. According to the UN's Food and Agriculture Organisation (FAO), some 2 billion

of the world's 7.3 billion people do not have enough to eat. Moreover, by 2050, the total population is projected to grow to almost 10 billion. Add this to the rising demand for meat, fish, milk and eggs, which is born of prosperity and which requires extra fodder to satisfy, and 70% more food will be needed in 2050 than was produced in 2009, the year the FAO did the calculation. That is a tall order. But it is not impossible.

Quornucopia

Since the time of Thomas Malthus, an economist writing a little over 200 years ago, people have fretted that population growth would outstrip food supply. So far, it has not. But neo-Malthusians spot worrying signs. One is that in some places the productivity of staples such as rice and wheat has reached a plateau. Neither new strains nor fancy agrochemicals are raising yields.

Nor is there much unfarmed land left that is suitable to be brought under the plough. A source of food Malthus did not foresee was the cultivation of the American prairies. This, and similar extensions of agricultural land, such as the opening up of the *cerrado* in Brazil, helped the food supply greatly. But such new lands are pretty much used up. Neo-Malthusians also point to climate change. They suggest that, if global temperatures continue to rise, some places will become unfarmable—particularly poor, tropical regions. ▶▶

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► These are legitimate concerns. But they can be overcome by two things: the application and dissemination of technology, and the implementation of sensible government policies.

Agricultural technology is changing fast (see *Technology Quarterly*). Much of this change is brought about by rich-world farmers and by affluent farmers in middle-income places like Brazil. Techniques developed in the West—especially genome-based breeding that can create crops with special properties almost to order—are being adapted to make tropical crops, such as cassava, hitherto untouched by scientific progress, both more productive and more nutritious. Such smart breeding, in alliance with new, precise techniques of genetic modification, should break through the yield plateaus. It can also produce crops with properties such as drought- and heat-resistance that will mitigate the effects of global warming. Drought-resistant maize created in this way is already on the market.

Technology is of little use, though, if it is not adopted. In the developing world that applies as much to existing farming techniques as it does to the latest advances in genetic modification. Yield plateaus are a phenomenon only of the most intensively farmed parts of the world. Extending to the smallholders and subsistence farmers of Africa and Asia the best of

today's agricultural practices, in such simple matters as how much fertiliser to apply and when, would get humanity quite a long way towards a requisite 70% increase in output. So would things like better roads, to allow for the carriage of surpluses to markets. This would encourage productivity growth and reduce waste.

Indeed, government policy to reduce waste more generally would make a huge difference. The FAO says that about a third of food is lost during or after harvest. In rich countries a lot of that is thrown away by consumers. In poor ones it does not reach consumers in the first place. Bad harvesting practices, poor storage and slow transport mean that food is damaged, spoiled or lost to pests. Changing that, which is mostly a question of building things like better, pest-proof grain silos and monitoring their contents properly, would take another big bite out of the 70% increase.

The neo-Malthusians may throw up their hands in despair, but consider this: despite all the apparent obstacles, from yield plateaus to climate change, in the six years following the FAO analysis cereal production rose by 11%. If growth like that continues it should not only be possible to feed the 10 billion, but to feed them well. ■

The trade in albino bones

For the colour of their skin

Superstition is fuelling a grisly trade in human body parts. Tanzania shows how it can be curbed



TO BE born with albinism is hard luck. This genetic condition, in which people lack pigments in their skin, hair and eyes, affects one in 20,000 worldwide and is more common in Africa. Albinos' pale skin is easily burned by the sun, and is vulnerable to cancer. Because their eyes are sensitive to harsh light, most albinos suffer from poor vision. However, these discomforts are trivial compared with the mistreatment that albinos often suffer at the hands of others.

For centuries people have believed that albinos are cursed. In parts of Africa babies born with albinism were once routinely killed. That ghastly tradition has died out, but others persist. In Swahili many people call albinos *zeru* (ghost) or *nguruwe* (pig). Children with the condition are often bullied at school and forced to eat separately from their peers. Many drop out. Those who complete school struggle to find work and die younger than their neighbours, not least because many end up taking unskilled jobs in the fields where they are exposed to the sun. Women are at higher risk of rape because of a myth that sex with an albino can cure HIV.

Worst of all, many albinos are murdered by people who think that their bones contain gold or have magical powers (see page 52). Some witchdoctors claim that amulets made from albino bones can cure disease or bring great wealth to those who wear them. A gruesome trade in their body parts has spurred killings in Tanzania, Burundi, Mozambique, Zambia and South Africa. Sometimes family members sell their albino nephews or cousins for cash.

In Malawi, the country worst affected, at least 18 people

(and probably many more) have been killed since the end of 2014, according to Amnesty International, a human-rights group. The pace of killings seems to be escalating. In April four people, including a 23-month-old baby, were murdered and dismembered. All that was left of the child when her body was found was a skull and a few teeth.

The government of Malawi has done little to prevent such horrors. Police officers who investigate killings are poorly trained and sometimes prejudiced against the victims. One man recently caught with human bones was fined less than \$30. Murder is hard to prove, so the authorities sometimes charge people found with human body parts with grave-robbing instead. Many albinos in Malawi are now too frightened to venture outdoors, let alone travel to the nearest town.

Je suis un noir; ma peau est blanche

Superstitions die hard, in any part of the world. Yet the senseless killing of albinos can be curbed. Tanzania, once one of the most dangerous countries in Africa for people with albinism, has sharply reduced the number of murders by clamping down on demand. It has banned unlicensed witchdoctors and increased penalties for those caught trading in body parts. It investigates albino murders energetically: in recent years it has arrested and convicted several "albino hunters". The police have issued mobile phones to many albinos so that they can call an emergency number if they feel unsafe. The recent appointment of an albino lawyer to the cabinet may also have helped reduce the stigma attached to the condition.

Stamping out this horror is not beyond hope; it requires good policing and political will. As Salif Keita, a great albino musician, has often pointed out, people should never be judged by the colour of their skin. ■

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Run Simple

The threat from TB

There is no better example of “When the drugs don’t work” (May 21st) than tuberculosis. Drug-resistant TB (DR-TB) takes up to two years to treat. TB has been a global health emergency since 1993, but by 2050 one person could die from DR-TB every 12 seconds if we continue on the current trajectory. The economic price is enormous. Taking no action will cost \$16.7 trillion by 2050, roughly equal to the annual economic output of the European Union.

Global stability and progress will be hampered. It is not a case of just low- or middle-income countries facing deaths and economic damage: we will all suffer the consequences. World leaders need urgently to step up and form a global coalition to implement the recommendations from Lord O’Neill’s review in full.

AARON OXLEY
Executive director
RESULTS UK
London

Miami in China

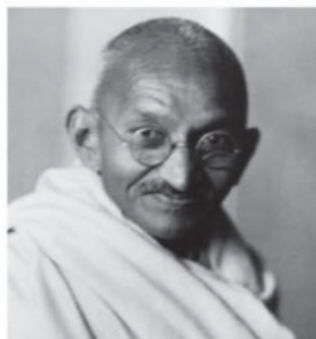
The island of Hainan has a rival as “China’s Florida” (May 28th): the hundreds of miles between Shenzhen and Shantou. On that southern coast Huidong has beautiful beaches, temperate climate and is only an hour’s drive from Shenzhen. The area is getting ready for the increase in Chinese pensioners you wrote about. One new development alone is being built to accommodate 100,000 households. Demand is high from Shenzhen and Hong Kong, where 35,000 people are on a waiting list for nursing services. The nursing beds in Huidong are expected to be eligible for a Hong Kong government subsidy of \$1,300 per person.

Given the rapid increase in family wealth, mobility and the demands created by a rapidly ageing population, a huge age-care industry is developing in China. The growth of retirement facilities is being driven by the government’s accelerating use of public-private partnerships, where

the government contributes the facility and entrepreneurs deliver the services. China is one of the last, and most exciting, global markets for businesses providing medical- and aged-care services.

ANDREW OKSNER
Campanile LLC
Hong Kong

Garment fact stories



Mahatma Gandhi’s championing of hand-woven cloth was not, as you suggest, because of opposition to industrialisation (“Southern comfort”, May 28th). Rather, it was a pragmatic tool to hurt the British colonial economy. He would have been delighted to see that the textiles industry, which was a central part of the Indian economy before it was destroyed by cheap British cotton imports in the 19th and 20th centuries, is once again flourishing.

The demise of the Indian industry came about not only because of better technology in Britain but also as a result of policies that discouraged industrial activity in India. The British required India to be a producer of raw material and a market for cheap finished goods, not a competitor. That is what Gandhi was targeting.

TARUN KHANNA
Berlin

Arab history

The ancient empires you mentioned in your special report on the Arab world (May 14th) were not Arab at all, but Muslim, founded and run by Kurds, Persians and Turks, among others, but rarely Arabs. The empires covered vast areas where people spoke Arabic dialects, but there was no

pan-Arab identity. That is a 20th-century construct. It would be more productive to acknowledge the diversity of the Arab world rather than ignore it. Maybe then we might begin to understand why the government in Tunis is democratic, whereas the one in Cairo is despotic.

MARO SCIACCHITANO
Portland, Oregon

At the very least, the powers that carved up Arab nations after the first world war should have heeded the report of the American King-Crane Commission, with its thorough descriptions of Arab political aspirations. The report was ignored because it did not fit British and French colonial ambitions.

HENRIK CARLBORG
Solna, Sweden

Prince Muhammad’s reform plan for Saudi Arabia is commendable and long overdue. However, this vision to a large extent overlooks women whose contribution to Saudi modernisation is constrained by Wahhabism and conservative clerics. Weaning the country off oil and modernising and diversifying the economy are ambitious goals. The real challenge lies in liberating half the population so that they too can effectively participate and contribute to the liberalisation of their country’s economy and the modernisation of their society.

JAROSLAV KINACH
Kiev, Ukraine

Essex is not the only way

Bagehot (May 21st) suggested that upwardly mobile residents of Essex are the “landlords of the political centre” in Britain. This analysis of the electoral battleground is, dare I say, a metropolitan view. Essex has as many Labour members of Parliament as Surrey, Kent, Hertfordshire, and Buckinghamshire—that is to say, zero. It will be solidly Tory for at least a generation.

The Midlands is where the magic happens. Modern British elections are won and lost in the sort of proudly

unfashionable places that most political advisers would struggle to locate on a map: Redditch, Telford, Peterborough, Corby, and Nuneaton, our very own Ohio. To Londoners, Essex probably seems remote and provincial. To us genuine provincials, it looks like a true-blue home county.

HARRY HOLT
Nottingham

According to the law in Brazil

“Way, José” (May 28th) described *jeitinho* in Brazil as a way of circumventing a law, and went on to say that Dilma Rousseff’s impeachment is a *jeitinho* round the constitution. Ms Rousseff and her allies claim that an impeachment triggered by budgetary misdemeanours is a coup, and that dodgy accounting practices by former presidents went unchecked by the budget watchdog and Congress. But her suspension from office is not a way around the law. It is the opposite: a law being enforced strictly.

The time when presidents could benefit from reckless accounting and unimpeded profligacy with taxpayers’ money will certainly not cause any *saudade* in Brazil.

BRUNO TROCCHI
Santiago, Chile

Quiet desperation

Your leader about the rise of the far right in Europe called on politicians to make an “equally rousing argument for moderation” (“Disaster averted—for now”, May 28th). This understandable but forlorn wish reminds me of the joke about what centrists chant at protest marches: “What do we want? Gradual improvement! When do we want it? As soon as economic conditions allow!”

PAUL MOSS
London ■

Letters are welcome and should be addressed to the Editor at The Economist, 25 St James’s Street, London SW1A 1HG
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Ministero
dei beni e delle
attività culturali
e del turismo

POSITION DESCRIPTION DIRECTORS OF ITALIAN MUSEUMS

Background

On May 27, 2016, the Italian Ministry of Cultural Heritage and Activities and Tourism (MiBACT) issued an **international call for applications** for the post of **Director for each of the 9 museums and archeological parks** listed below:

- | | |
|---|--|
| 1) Complesso monumentale della Pilotta (Parma) | 6) Parco Archeologico dell'Appia antica |
| 2) Museo delle Civiltà (Roma) | 7) Parco Archeologico di Ercolano |
| 3) Museo Nazionale Etrusco di Villa Giulia (Roma) | 8) Parco Archeologico di Ostia antica |
| 4) Museo Storico e Parco del Castello di Miramare (Trieste) | 9) Villa Adriana e Villa D'Este (Tivoli) |
| 5) Parco Archeologico dei Campi Flegrei | |

The Position

The new Directors will provide **strategic leadership and management expertise** for the abovementioned museums and archaeological parks. They will lead the Administrative Board and the Scientific Committee of their respective museums. Each Director will supervise **(i)** the museum's managerial, organizational and financial planning activities; **(ii)** all cultural programs of the museum; **(iii)** all details of the museum's relations with visitors, local communities, national and international stakeholders, as well as national and international peer institutions.

Application guidelines and further details are available at the following link: www.beniculturali.it/museitaliani

Deadline: **20 July 2016**

THE AFRICAN DEVELOPMENT BANK

The African Development Bank (the Bank) is the premier pan-African development institution, promoting economic growth and social progress across the continent. The Bank's development agenda is delivering the financial and technical support for transformative interventions that will significantly reduce poverty, through inclusive and sustainable economic growth. It is Africa's voice on global economic, financial and development issues. The Bank will focus its investments around five priority areas, President Adesina's High 5's: **light up and power Africa; feed Africa; industrialize Africa; integrate Africa; and improve the quality of life for the people of Africa**. The Bank is building a world-class senior management team that will lead the successful implementation of this vision.



AFRICAN DEVELOPMENT BANK GROUP

Vice President, Agriculture, Human and Social Development

The Vice President, Agriculture, Human and Social Development (VP, AHSD) will develop and launch the Bank's Africa-wide agricultural transformation agenda. S/he will work with Member countries and the private sector to drive agricultural industrialization and to deliver inclusive and sustainable transformation initiatives.

The VP, AHSD must have a global reputation and expertise in agriculture programme delivery with a proven track-record in leveraging the transformative power of agriculture to achieve broader development objectives. S/he will have the experience and credibility to mobilise stakeholders, convene international partners, and lead major transformation initiatives.

Vice President, Private Sector, Infrastructure and Industrialization

The Vice President, Private Sector, Infrastructure and Industrialization (VP, PSII) will accelerate investments in critical infrastructure and will champion and create the conditions for rapid industrialization. S/he will support countries to improve their business and investment environments; to drive private sector development; to enhance manufacturing capacity and participation in global value-chains; and to develop and promote intra-regional trade.

The VP, PSII will bring senior leadership experience in the private sector with a deep knowledge of infrastructure and financial market development in Africa.

All roles report to the President and require a minimum of 15 years of proven leadership and relevant experience; an advanced degree in a related field of study is also required. Fluency in English and/or French, with a working knowledge of the other language is required.

Russell Reynolds Associates are assisting the African Development Bank with this appointment. For further information about any of these roles and details of how to apply, please visit Russell Reynolds Associates website at www.rraresponses.com. **The closing date for applications 1 July 2016.**



Vice President, Power, Energy and Green Growth

The Vice President, Power, Energy and Green Growth (VP, PEGG) will champion the New Deal on Energy for Africa and will lead the Transformative Partnership on Energy for Africa to achieve universal access to energy in Africa. The Bank will invest US\$35 billion in the energy sector within the next 10 years and will leverage a further US\$45 billion to US\$50 billion in investments into the sector.

S/he will be a thought-leader with a track record in large-scale electrification; mega-project execution across borders; and, more broadly, energy systems capacity building.

Vice President, Regional Development, Integration and Business Delivery

The Vice President, Regional Development, Integration and Business Delivery (VP, RDIBD) will drive the implementation and execution of a new development and business delivery model for the Bank. S/he will create and lead five new regional development and business delivery offices. The VP, RDIBD will deepen regional integration by cultivating strategic partnerships with regional economic communities and development banks, and will execute major regional projects to improve trade and competitiveness.

S/he will have broad knowledge of the state of regional integration and development in Africa and the linkages across sectors. S/he will bring senior executive experience in operations in Africa with a record of delivering results in complex project, country and partner arrangements.



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DIRECTOR OF ECONOMICS AND ENVIRONMENT



INTERNATIONAL LEAD AND ZINC STUDY GROUP (ILZSG) AND INTERNATIONAL NICKEL STUDY GROUP (INSG)

The International Lead and Zinc Study Group (ILZSG) and the International Nickel Study Group (INSG), intergovernmental organizations based in Lisbon, Portugal, are seeking a Director of Economics and Environment to work jointly for both Groups.

The successful applicant will be required to apply a good understanding of international economics and extensive economic policy experience to the analysis of economic and environmental issues relating to lead, zinc and nickel, and to prepare, and present publicly, detailed reports of a high standard. Although not a prerequisite, experience in the minerals or metals industry would be valuable.

The successful applicant must be able to work flexibly in a small professional team, possess tertiary qualifications in a relevant field, and be fluent in English.

The starting salary will depend on the applicant's qualifications and experience. Benefits include a Provident Fund, six weeks annual leave and a relocation allowance where applicable.

Applications with Curriculum Vitae should be forwarded by email to insg@insg.org by not later than 8 July 2016



Teaching the teachers

BOSTON, NEWARK AND NEW YORK

Great teaching has long been seen as an innate skill. But reformers are showing that the best teachers are made, not born

TO THE 11- and 12-year-olds in his maths class, Jimmy Cavanagh seems like a born teacher. He is warm but firm. His voice is strong. Correct answers make him smile. And yet it is not his pep that explains why his pupils at North Star Academy in Newark, New Jersey, can expect to go to university, despite 80% of their families needing help to pay for school meals.

Mr Cavanagh is the product of a new way of training teachers. Rather than spending their time musing on the meaning of education, he and his peers have been drilled in the craft of the classroom. Their dozens of honed techniques cover everything from discipline to making sure all children are thinking hard. Not a second is wasted. North Star teachers may seem naturals. They are anything but.

Like many of his North Star colleagues are or have been, Mr Cavanagh is enrolled at the Relay Graduate School of Education. Along with similar institutions around the world, Relay is applying lessons from cognitive science, medical education and sports training to the business of supplying better teachers. Like doctors on the wards of teaching hospitals, its students often train at excellent institutions, learning from experienced high-calibre peers. Their technique is calibrated, practised, coached and relentlessly assessed like that of a top-

flight athlete. Jamey Verrilli, who runs Relay's Newark branch (there are seven others), says the approach shows teaching for what it is: not an innate gift, nor a refuge for those who, as the old saw has it, "can't do", but "an incredibly intricate, complex and beautiful craft".

Hello, Mr Chips

There can be few crafts more necessary. Many factors shape a child's success, but in schools nothing matters as much as the quality of teaching. In a study updated last year, John Hattie of the University of Melbourne crunched the results of more than 65,000 research papers on the effects of hundreds of interventions on the learning of 250m pupils. He found that aspects of schools that parents care about a lot, such as class sizes, uniforms and streaming by ability, make little or no difference to whether children learn (see chart on next page). What matters is "teacher expertise". All of the 20 most powerful ways to improve school-time learning identified by the study depended on what a teacher did in the classroom.

Eric Hanushek, an economist at Stanford University, has estimated that during an academic year pupils taught by teachers at the 90th percentile for effectiveness learn 1.5 years' worth of material. Those

taught by teachers at the 10th percentile learn half a year's worth. Similar results have been found in countries from Britain to Ecuador. "No other attribute of schools comes close to having this much influence on student achievement," he says.

Rich families find it easier to compensate for bad teachers, so good teaching helps poor kids the most. Having a high-quality teacher in primary school could "substantially offset" the influence of poverty on school test scores, according to a paper co-authored by Mr Hanushek. Thomas Kane of Harvard University estimates that if African-American children were all taught by the top 25% of teachers, the gap between blacks and whites would close within eight years. He adds that if the average American teacher were as good as those at the top quartile the gap in test scores between America and Asian countries would be closed within four years.

Such studies emphasise the power of good teaching. But a question has dogged policymakers: are great teachers born or made? Prejudices played out in popular culture suggest the former. Bad teachers are portrayed as lazy and kid-hating. Edna Krabappel of "The Simpsons" treats lessons as obstacles to cigarette breaks. Good and inspiring teachers, meanwhile, such as Michelle Pfeiffer's marine-turned-educator in "Dangerous Minds" (pictured), or J.K. Rowling's Minerva McGonagall, are portrayed as endowed with supernatural gifts (literally so, in the case of the head of Gryffindor). In 2011 a survey of attitudes to education found that such portrayals reflect what people believe: 70% of Americans thought the ability to teach was more the result of innate talent than training. ▶▶

▶ Elizabeth Green, the author of “Building A Better Teacher”, calls this the “myth of the natural-born teacher”. Such a belief makes finding a good teacher like panning for gold: get rid of all those that don’t cut it; keep the shiny ones. This is in part why, for the past two decades, increasing the “accountability” of teachers has been a priority for educational reformers.

There is a good deal of sense in this. In cities such as Washington, DC, performance-related pay and (more important) dismissing the worst teachers have boosted test scores. But relying on hiring and firing without addressing the ways that teachers actually teach is unlikely to work. Education-policy wonks have neglected what one of them once called the “black box of the production process” and others might call “the classroom”. Open that black box, and two important truths pop out. A fair chunk of what teachers (and others) believe about teaching is wrong. And ways of teaching better—often much better—can be learned. Grit can become gold.

In 2014 Rob Coe of Durham University, in England, noted in a report on what makes great teaching that many commonly used classroom techniques do not work. Unearned praise, grouping by ability and accepting or encouraging children’s different “learning styles” are widely espoused but bad ideas. So too is the notion that pupils can discover complex ideas all by themselves. Teachers must impart knowledge and critical thinking.

Those who do so embody six aspects of great teaching, as identified by Mr Coe. The first and second concern their motives and how they get on with their peers. The third and fourth involve using time well, fostering good behaviour and high expectations. Most important, though, are the fifth and sixth aspects, high-quality instruction and so-called “pedagogical content knowledge”—a blend of subject knowledge and



Multipliciamus

teaching craft. Its essence is defined by Charles Chew, one of Singapore’s “principal master teachers”, an elite group that guides the island’s schools: “I don’t teach physics; I teach my pupils how to learn physics.”

Branches of the learning tree

Teachers like Mr Chew ask probing questions of all students. They assign short writing tasks that get children thinking and allow teachers to check for progress. Their classes are planned—with a clear sense of the goal and how to reach it—and teacher-led but interactive. They anticipate errors, such as the tendency to mix up remainders and decimals. They space out and vary ways in which children practise things, cognitive science having shown that this aids long-term retention.

These techniques work. In a report published in February the OECD found a link between the use of such “cognitive activation” strategies and high test scores among its club of mostly rich countries. The use of memorisation or pupil-led learning was common among laggards. A recent study by David Reynolds compared maths teaching in Nanjing and Southampton, where he works. It found that in China, “whole-class interaction” was used 72% of the time, compared with only 24% in England. Earlier studies by James Stigler, a psychologist at UCLA, found that American classrooms rang to the sound of “what” questions. In Japan teachers asked more “why” and “how” questions that check students un-

derstand what they are learning.

But a better awareness of how to teach will not on its own lead to great teaching. According to Marie Hamer, the head of initial teacher training at Ark, a group of English schools: “Too often teachers are told what to improve, but not given clear guidance on how to make that change.” The new types of training used at Relay and elsewhere are intended to address that.

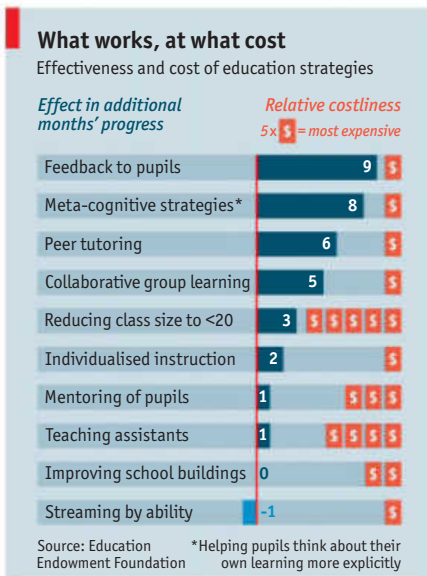
David Steiner of the Johns Hopkins Institute for Education Policy, in Baltimore, characterises many of America’s teacher-training institutions as “sclerotic”. It can be easier to earn a teaching qualification than to make the grades American colleges require of their athletes. According to Mr Hattie none of Australia’s 450 education training programmes has ever had to prove its impact—nor has any ever had its accreditation removed. Some countries are much more selective. Winning acceptance to take an education degree in Finland is about as competitive as getting into MIT. But even in Finland, teachers are not typically to be found in the top third of graduates for numeracy or literacy skills.

In America and Britain training has been heavy on theory and light on classroom practice. Rod Lucero of the American Association of Colleges for Teacher Education (AACTE), a body representing more than half of the country’s teacher-training providers, says that most courses have a classroom placement. But he concedes that it falls short of “clinical practice”. After finishing an undergraduate degree in education “I didn’t feel I was anywhere near ready,” says Jazmine Wheeler, now a first-year student at the Sposato Graduate School of Education, a college which grew out of the Match charter schools in Boston.

This fits with a pattern Mr Kane’s research reveals to be “almost constant”: new teachers lack classroom management and instruction skills. As a result they struggle at first before improving over the subsequent three to five years. The new teaching schools believe that those skills which teachers now pick up haphazardly can be systematically imparted in advance. “Surgeons start on cadavers, not on live patients,” Mr Kane notes.

“We have thought a lot about how to teach 22-year-olds,” says Scott McCue, who runs Sposato. He and his colleagues have crunched good teaching into a “taxonomy” of things to do and say. “Of the 5,000 or so things that go into amazing teaching,” says Orin Gutlerner, Sposato’s founding director, “we want to make sure you can do the most important 250.”

The curriculum of the new schools is influenced by people like Doug Lemov. A former English teacher and the founder of a school in Boston, Mr Lemov used test-score data to identify some of the best teachers in America. After visiting them and analysing videos of their classes to find out pre-▶



precisely what they did, he created a list of 62 techniques. Many involve the basics of getting pupils' attention. "Threshold" has teachers meeting pupils at the door; "strong voice" explains that the most effective teachers stand still when talking, use a formal register, deploy an economy of language and do not finish their sentences until they have their classes' full attention.

But most of Mr Lemov's techniques are meant to increase the number of pupils in a class who are thinking and the amount of time that they do so. Techniques such as his "cold call" and "turn and talk", where pupils have to explain their thoughts quickly to a peer, give the kinds of cognitive workouts common in classrooms in Shanghai and Singapore, which regularly top international comparisons.

Trainees at Sposato undertake residencies at Match schools. They spend 20 hours per week studying and practising, and 40-50 tutoring or assisting teachers. Mr Gutlerner says that the most powerful predictor of residents' success is how well they respond to the feedback they get after classes.

This new approach resembles in some ways the more collective ethos seen in the best Asian schools. Few other professionals are so isolated in their work, or get so little feedback, as Western teachers. Today 40% of teachers in the OECD have never taught alongside another teacher, observed another or given feedback. Simon Burgess of the University of Bristol says teaching is still "a closed-door profession", adding that teaching unions have made it hard for observers to take notes in classes. Pupils suffer as a result, says Pasi Sahlberg, a former senior official at Finland's education department. He attributes much of his country's success to Finnish teachers' culture of collaboration.

As well as being isolated, teachers lack well defined ways of getting better. Mr Gutlerner points out that teaching, alone among the professions, asks the same of novices as of 20-year veterans. Much of what passes for "professional development" is woeful, as are the systems for assessing it. In 2011 a study in England found that only 1% of training courses enabled teachers to turn bad practice into good teaching. The story in America is similar. This is not for want of cash. The New Teacher Project, a group that helps cities recruit teachers, estimates that in some parts of America schools shell out about \$18,000 per teacher per year on professional development, 4-15 times as much as is spent in other sectors.

The New Teacher Project suggests that after the burst of improvement at the start of their careers teachers rarely get a great deal better. This may, in part, be because they do not know they need to get better. Three out of five low-performing teachers in America think they are doing a great job. Overconfidence is common elsewhere: nine out of ten teachers in the OECD say they are well prepared. Teachers in England congratulate themselves on their use of cognitive-activation strategies, despite the fact that pupil surveys suggest they rely more on rote learning than teachers almost everywhere else.

It need not be this way. In a vast study published in March, Roland Fryer of Harvard University found that "managed professional development", where teachers receive precise instruction together with specific, regular feedback under the mentorship of a lead teacher, had large positive effects. Matthew Kraft and John Papay, of Harvard and Brown universities, have found that teachers in the best quarter of schools ranked by their levels of support

improved by 38% more over a decade than those in the lowest quarter.

Such environments are present in schools such as Match and North Star—and in areas such as Shanghai and Singapore. Getting the incentives right helps. In Shanghai teachers will not be promoted unless they can prove they are collaborative. Their mentors will not be promoted unless they can show that their student-teachers improve. It helps to have time. Teachers in Shanghai teach for only 10-12 hours a week, less than half the American average of 27 hours.

No dark sarcasm

In many countries the way to get ahead in a school is to move into management. Mr Fryer says that American school districts "pay people in inverse proportion to the value they add". District superintendents make more money than teachers although their impact on pupils' lives is less. Singapore has a separate career track for teachers, so that the best do not leave the classroom. Australia may soon follow suit.

The new models of teacher training that will start those careers have yet to be thoroughly evaluated. Early evidence is encouraging, however. Relay and Sposato both make their trainees' graduation dependent on improved outcomes for students. A blind evaluation that Relay undertook of its teachers rated them as higher than average, especially in classroom management. At Ark, in England, recent graduates are seen by the schools that have hired them as among the best cohorts that they have received.

Mr Steiner notes, though, that it is not yet clear whether these new teachers are "school-proof": effective in schools that lack the intense culture of feedback and practice of places like Match. This is a big caveat: across the OECD two-thirds of teachers believe their schools to be hostile to innovation.

If the new approaches can be made to work at scale, that should change. Relay will be in 12 cities by next academic year, training 2,000 teachers and 400 head teachers, including those from government-run schools. This year AACTE launched its own commission investigating ways in which its colleges could move to a similar model. In England Matthew Hood, an entrepreneurial assistant head teacher, has plans for a Relay-like "Institute for Advanced Teaching".

This way, reformers hope, they can finally improve education on a large scale. Until now, the job of the teacher has been comparatively neglected, with all the focus on structural changes. But disruptions to school systems are irrelevant if they do not change how and what children learn. For that, what matters is what teachers do and think. The answer, after all, was in the classroom. ■



Mr Schneebly needs his feedback



Hillary Clinton

Madam presumptive nominee

SANTA ANA, CALIFORNIA AND WASHINGTON, DC

The former First Lady takes a big step towards getting her old house back

AS IF weary of a primary tussle in which the outcome has long been obvious, Democratic voters knocked it on the head on June 7th. Bernie Sanders, whose refusal to admit defeat defies electoral mathematics, hoped to win at least four of the last six states up for grabs, including the biggest, California. But Hillary Clinton whupped him; she won the Golden State by a 13-point margin, also New Jersey, New Mexico and South Dakota.

In the process, the former secretary of state secured a big majority of the 4,765 delegates who will attend the Democrats' National Convention in July. That makes her the prospective nominee, the first woman to hold the role for either big party and, given how spectacularly ill-chosen her Republican counterpart, Donald Trump, seems, the favourite to be America's next president. For a politician whose woodenness as a campaigner has been as conspicuous as her toughness, and for the 15.5m Democrats who have voted for her, it is an impressive achievement.

Even before these last primaries (only Washington, DC, on June 14th, is still to vote) the Associated Press reckoned Mrs Clinton had the 2,383 delegates required for the nomination. Nervously, her campaign team tried to downplay this. The reckoning was based on Mrs Clinton's big lead among superdelegates—the 715-odd Democratic office-bearers who may vote at

the convention as they please—which Mr Sanders has decried as an establishment stitch-up. Mrs Clinton's aides also feared that declaring victory before the primaries would make her supporters complacent. They worried too much.

Just as the Republican primary contest ended last month with a flurry of unexpectedly big wins for Mr Trump, as resistance to his candidacy crumbled, so Mrs Clinton outperformed her polling in almost every state; recent polls in California had suggested she was barely ahead. She has secured almost 400 more regular delegates, the sort awarded at primaries and caucuses than Mr Sanders, and 3.5m more votes. No wonder Mrs Clinton appeared ecstatic, even tearful, at a celebratory rally in New York, before California's polls had even closed. Movingly, she recalled that her mother was born on the day, June 4th 1919, Congress voted to give women the vote: "I wish she could see her daughter become the Democratic Party's nominee!"

Mr Trump probably had a hand in Mrs Clinton's late surge, by offending, and so rallying, the non-white voters who are among her main supporters. As his party's nominee, endorsed in recent weeks by most senior Republicans (though many of them privately despise him), the celebrity builder had been expected to tone down his signature boorishness; he himself had sworn to be "very presidential at the ap-

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propriate time". Apparently unable to control himself, he has instead levelled bigoted abuse at a federal judge presiding over allegations of fraud against one of his failed businesses, Trump University. Mr Trump accused Gonzalo Curiel of being biased against him on account of his tough line on illegal immigration because, he says, the judge is "Mexican" (as it happens, Mr Curiel is from Indiana). No exit polls were conducted in California, where Hispanics account for over a quarter of the electorate, but Mrs Clinton won all the most Hispanic districts there.

At a polling station in Santa Ana, a largely-Hispanic area south of Los Angeles, most voters said they were for Mrs Clinton—and often they mentioned Mr Trump disparagingly in the same breath. Anita Hernandez, a retired school secretary, said that choosing Mrs Clinton was in the end an "easy decision", though she had once been tempted by Mr Sanders: "I think he should stop and let her do her thing." Another retiree, Leo Luna, voted the same way—despite personally preferring the senator from Vermont. "We have to unify ourselves behind a strong candidate," he said. "I think there's a lot at stake...remember, we are all basically the sons and daughters of immigrants."

Amazingly, on June 8th Mr Sanders reiterated his pledge to fight on to the convention. Perhaps he may rethink that. His retinue, which was never large, is thinning; on the same day, Jeff Merkley, Mr Sanders's only supporter among his fellow senators, and Raul Grijalva, one of his handful of backers in the House of Representatives, suggested he should quit. His campaign was meanwhile laying off most of its employees. As *The Economist* went to press, Mr Sanders was due to hold talks with Barack Obama, who would like him to with- ▶▶

▶ draw ahead of the president's imminent endorsement of Mrs Clinton. Even before polling ended in California, a close adviser to Mr Sanders hinted that he might stay in for the Washington, D.C., primary, then quit. Little-known before he announced his presidential run last year, Mr Sanders has fought an astonishingly effective and, for many of his 12m supporters, inspiring campaign: it is over already.

Mrs Clinton in a sense signalled that on June 2nd with what was billed as a speech about foreign policy, but was actually an exhortation of almost everything Mr Trump has said on the subject. Her rival's "ideas aren't just different," she said. "They're not even really ideas, just a series of bizarre rants, personal feuds and outright lies."

This was a response to Mr Trump's increasingly vicious attacks on her; he has called Mrs Clinton an enabler of an adulterous husband and hinted she could be a murderer. It was also manna for many Clinton supporters. Deeply frustrated by her failings as a campaigner—which have

been exacerbated by Mrs Clinton's need to tiptoe around Mr Sanders, whose supporters she covets and with whose ideas she sympathises—they have been longing for her to stick it to Mr Trump.

Emotionally tough and intellectually rigorous in a prosecutorial sort of way, Mrs Clinton is better at winning voters' regard than their love. Even so, they might be forgiven for wondering what she stands for. Her policy platform is built on all sorts of worthy centre-left nudges and nudges, but no talismanic idea. Even Bill Clinton, who claims to know her best, praises Mrs Clinton as an incrementalist, not a visionary; "Everything she touched she made better," he says of her early career.

Yet as an argument for a third Democratic term, not the new broom that Mr Obama was in the right time and place to promise, moderate improvement is at least credible. And then, a real partisan punch-up, unprecedented in its viciousness, is what many voters seem to want from this election. The Democrats have picked the right woman to deliver it. ■

Republicans and welfare

Ryan's ramble

WASHINGTON, DC

The Speaker launches a Republican anti-poverty agenda

PAUL RYAN, the Republican Speaker of the House of Representatives, is known for his love of detailed policy. Donald Trump, his party's presumptive nominee for president, does not share this fondness. So it was fitting that on June 7th, while Mr Trump was busy fighting—or basking in—the scandal over his latest remarks on race, Mr Ryan was launching a policy paper. The report, on poverty and welfare, was somewhat overshadowed by the Speaker using the question-and-answer session to wade into the row about Mr Trump's pronouncements. But there is time for wonkery yet: the paper is the first of six which will form a new agenda for Republicans, dubbed "A Better Way". The policies are supposed to be implemented if the party takes back the White House, though how much of it Mr Trump supports is anyone's guess.

The paper has three notable themes. The first is simplification. Mr Ryan sees the welfare system as a sprawling mess. More than 80 federal welfare programmes sit atop one another, with little attention paid to their compatibility, and without government agencies much co-operating in their administration. Each programme—be it food stamps, housing subsidies, or Medicare—has its own eligibility rules. As low-earners' incomes increase, benefits are withdrawn in a hodgepodge fashion. As a result, the marginal tax rate, including both taxes and withdrawn benefits, jumps ▶▶



A plan with a price

The campaigns

Heard on the trail



Potty humour

"At the start, orders were for around 100 rolls a time, but now we're getting orders for 5,000 rolls."

Qingdao Wellpaper Industrial in China has been selling presidential-candidate toilet paper. Mr Trump is outselling Mrs Clinton. China Daily

Viva Mexico

"Donald Trump is a brand—a big brand—and when you are asking a [sponsor] to invest millions of dollars in branding a tournament and they're going to share that brand with a host...it's a difficult conversation."

The PGA is moving the World Golf Championship from a Trump-owned golf course in Miami to Mexico City—not Mr Trump's favourite place—because of problems with finding sponsorship

Pop Muzak

"Feel It in Your Guts."

Bernie Sanders and Thurston Moore, a founder of Sonic Youth, have produced a single about inequality and human rights. *Entertainment Weekly*

The flayed woman

"Donald Trump will peel her skin off in a debate setting."

Rick Perry's imagination has turned Titianesque. *Fox News*

Escape plan

"Make dating great again. Maple Match makes it easy for Americans to find the ideal Canadian partner to save them from the unfathomable horror of a Trump presidency."

Canada continues to tease Americans. www.maplematch.com

Benghazi!

"I made lot of money with Qaddafi." Mr Trump explains why he didn't support intervention in Libya. *CBS News*

Outreach (1)

"But we're building a wall. He's a Mexican. We're building a wall between here and Mexico."

Mr Trump attacks the judge hearing a lawsuit against Trump University. The judge, born in Indiana, is of Mexican ancestry. CNN

Outreach (2)

"I was the one that really broke the glass ceiling on behalf of women, more than anybody in the construction industry." *Mr Trump on why women should support him. Fox News*

Outreach (3)

"Oh, look at my African-American over here—look at him. Are you the greatest?" *Mr Trump exploits Ali-fervour*



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around erratically. Sometimes it exceeds 100%, meaning workers are better-off earning less. Mr Ryan wants to consolidate the programmes. Such a simplification—and a reduction in marginal tax rates—would be welcome.

The second theme is value for money. The paper complains that not enough programmes are rigorously evaluated, and calls for the government to open up its data to researchers. It also notes that states can simply shift claimants towards federally-funded programmes (such as disability benefits) rather than helping them find work. Mr Ryan wants to fix this, perhaps by gradually reducing the share of the bill the federal government foots for any given individual, the longer they stay on the welfare-rolls.

The third—and probably the most divisive—idea is to ramp up work requirements. In 1996, welfare reform under President Bill Clinton and the Republican Speaker, Newt Gingrich, required states to ensure that sufficient numbers of their cash welfare recipients were in work, training and the like. Mr Ryan suggests expanding that to cover housing subsidies, too.

The left will see this as an attempt to unpick yet another part of the safety net. Under the 1996 reform, one way states could satisfy work requirements was by shrinking their welfare-rolls, whether or not those who lost their benefits found a job. Unsurprisingly, cash welfare became much harder to come by. In 1996, Temporary Assistance for Needy Families—as cash-welfare is called—benefitted 68 families for every 100 families in poverty, according to the Centre for Budget and Policy Priorities, a left-leaning think-tank. Today, the figure is just 26.

Mr Ryan also bemoans the numbers of adults without dependents who claim food stamps (or, more formally, “Supplemental Nutrition Assistance”) without working or preparing to work. This is a red herring. The 1996 reforms already barred able-bodied adults without children from receiving food stamps while unemployed for more than three months in any three-year period. True, this rule was mostly suspended during the recession. But work requirements are now back in force in more than 40 states. There is little more Republicans could do on this front.

One part of the plan will please Democrats: Mr Ryan wants to expand the Earned Income Tax Credit, a wage top-up for low earners (though he also complains about high rate of erroneous payments, which reached 27% in 2014). That is unlikely to be enough to placate the left, though: Elizabeth Warren, a Democratic senator, dismissed the paper as “an agenda for creating poverty”. Don’t expect another bipartisan welfare deal. Despite the two men’s differences, Mr Ryan must pin all his hopes on Mr Trump. ■



Swimming religiously

Scruples and splashes

NEW YORK

A battle over women-only bathing hours roils a public pool

IN WILLIAMSBURG, an eclectic neighbourhood in Brooklyn, the bathing times at a public swimming pool are dividing hipsters from Hasidic Jews. For 20 years, to accommodate local Orthodox Jewish women whose religious modesty prevents them from swimming in mixed company, the Metropolitan Recreation Centre has reserved time four days each week for a “women’s swim”. But an anonymous complaint this spring prompted New York City’s human-rights commission to scuttle the arrangement, finding that the women’s-only times—a total of 7.25 hours out of the pool’s 90-hour weekly schedule—amounted to illegal discrimination. That decision was put on hold after Dov Hikind, an assemblyman representing another Brooklyn neighbourhood with large numbers of Hasidic Jews, complained.

“Everybody into the pool,” the *New York Times* editorialised, in response to Mr Hikind’s successful intervention. Continuing to allow women to enjoy exclusive hours in the pool this summer while the city tries to find a compromise is “a capitulation to a theocratic view of government services”. Donna Lieberman, executive director of the New York Civil Liberties Union, said that while New Yorkers “have every right to limit their swimming in accordance with their religious beliefs”, Orthodox Jews “have no right to impose a regime of gender discrimination on a public pool”. People whose religious scruples prevent them from splashing with members of the opposite sex, the *Times* advised, should “find their own private place to swim when and with whom they see fit.”

This is far from the first dispute over

who may swim in public pools. Though most municipal pools were desegregated after the second world war, racial tensions continued in the waters. Whites often stopped swimming once blacks were allowed in. New pools were built in white neighbourhoods to, in effect, rope others out. And some cities opted to drain their pools for good rather than operate them as integrated facilities, a strategy that was blessed by the Supreme Court in *Palmer v Thompson* (1971). At private pools and country clubs, both blacks and Jews found themselves unable to wallow well into the 1960s, prompting Groucho Marx to plead: “My daughter’s only half Jewish—can she wade in up to her knees?”

Unlike these moves to exclude undesirables from the water, the sex-segregated swimming times in Williamsburg cater to people whose beliefs would otherwise keep them at home. A similar aim has moved other cities, including Seattle and St Louis Park, Minnesota, to introduce female-only swimming times—to serve both Jewish and Muslim women. The *Times* may have condemned the arrangement in Brooklyn as religious intrusion into secular space, but a few months ago it hailed a Saturday-night women-only swimming programme in Toronto as reflecting “an ethos of inclusion” for the city’s Muslims.

In these gender-bending times, agreeing to reserve time for women is itself a fraught proposition. Bill de Blasio, New York’s mayor, was asked whether transgender women were allowed to swim during female-only hours. He had no quick answer. That, he said, is under review. ■

Chicago’s museum wars

Light against dark

CHICAGO

George Lucas is threatening to take his museum to another city

BOTH sides are stubborn in their battle over the site of the planned Lucas Museum of Narrative Art. George Lucas, the creator of “Star Wars”, his wife, Mellody Hobson, and the city government have set their heart on Chicago’s lakeshore as the site for the museum’s futuristic building. Friends of the Parks, a non-profit organisation, says Mr Lucas can build his museum anywhere he chooses, but not east of Lake Shore Drive, the expressway running along the shoreline of Lake Michigan, an area of (mostly) open views that is owned by the public. The battle reached fever pitch in early May when Rahm Emanuel, the mayor of Chicago, petitioned a federal appeal court to throw out a long-winded lawsuit, filed in 2014 by Friends of the Parks ►►

▶ in a district court, to block use of the site. In February an Illinois district-court judge refused to dismiss the suit. On May 10th he postponed its hearing to June 15th.

The Lucas family is in no mood to wait any longer for the construction of the museum, which was supposed to start in the spring. Ms Hobson says they are now looking at other cities, and blasts Friends of the Park for slamming the door on more than \$2 billion in economic benefits for the state, as well as thousands of jobs and educational opportunities for children. “As an African-American who has spent my entire life in this city I love, it saddens me that young black and brown children will be denied the chance to benefit from what this museum will offer,” says Ms Hobson.

That this should become another argument about race is a sign of how bitter the dispute has become. The site, south of the Soldier Field football stadium, is already heavily developed. It lies within walking distance of the Shedd Aquarium, the Adler Planetarium and the Field Museum of Natural History, and serves as a hardly used car park. Mr Emanuel mocks the parks’ protectors as “Friends of the Parking Lot”.

The parks’ guardians argue that a mandate—which dates back to 1836 and says Chicago’s lakeshore must remain public and “remain forever open, clear and free of any buildings, or other obstruction whatever”—is at stake. They also rejected on principle Mr Emanuel’s Plan B, which would involve the demolition of one of the hideous buildings of the McCormick convention centre on the lakeshore and replace it with the (much smaller) Lucas museum as well as additional parkland. Many think this is pigheaded.

Few dispute the attraction of the project. According to a recent survey, 73% of the city’s parents say the Lucas museum should be built in their city and 81% say they would probably visit it. The museum will focus on storytelling throughout the ages, from prehistoric times to today, through paintings and sculptures, photography, cartoons, advertising, digital technology and cinema, explains Don Bacigalupi, its founding boss. It will have three film theatres, lecture halls, a vast library and, no doubt, an even bigger gift shop.

Ms Hobson and her husband have already directed much of their philanthropy towards the South Side, and their museum would almost certainly be a boon for the troubled neighbourhood. “You get this chance once in a couple of generations,” says Steve Koch, deputy mayor of Chicago. “To blow it would be such a great shame.”

All depends now on the decision of the appellate court. Construction is estimated to take three and a half years. “A 2020 opening would be fine,” says a hopeful Mr Bacigalupi. Should Chicago lose the museum, Los Angeles and San Francisco already have their avid eyes on it. ■



Cannabis in the capital

Federal haze

WASHINGTON, DC

The District’s odd governance makes for even odder drug laws

ON A street corner five blocks from Congress, a transaction of uncertain legality is taking place. A man in his 20s, wearing a red Stanford University hooded top, is handing your correspondent a bottle of fruit juice. The cost? \$55. The juice’s steep price does not reflect yet another innovation in artisanal pulping. Rather, it explains the free gift that accompanies the juice—a branded green bag containing about an eighth of an ounce (3.5 grams) of cannabis.

Since 2015 it has been legal to own, grow and use cannabis privately in Washington, DC. Generous souls are allowed to give small amounts to whom ever they like. It is illegal, however, to sell it. Small businesses have sprung up seeking to exploit this dichotomy. With names such as HighSpeed, Kush Gods and 24/7 Strong Supply, their main objective is clear. The most notorious business, Kush Gods, sends cars emblazoned with cannabis leaves around the city to solicit “donations” from passers-by in return for cannabis-infused edibles or pre-rolled joints. The four states that have legalised cannabis for recreational use have also set up systems to tax and regulate it. In DC, which has not, something like a barter economy has sprung up instead.

Unusual though this may be, it arises from a familiar political tussle between the federal government and the place it calls home. The city is a federal jurisdiction; its budget must be approved by the congressmen who sit on Capitol Hill, some of whom are not keen on creeping marijuana legalisation. Shortly after the

legalisation ballot was passed, a congressional rider was attached to DC’s budget forbidding the use of federal or local funds for regulating the market.

Able to legalise cannabis but unable to tax or regulate it, DC finds itself in a strange hinterland of legality. And because nearly 30% of the District consists of federal land, on which cannabis is still classed as a Schedule 1 drug (along with heroin and LSD), it can be legal to possess cannabis on one side of a street and illegal on the other.

Yet, despite initial threats from disgruntled congressmen, a hazy entente has sprung up within the city. In April a 51-foot-long inflatable joint was paraded near the White House by activists seeking to persuade Barack Obama to change the federal laws on cannabis. The parade was followed by a mass “smoke-in”, but the plumes emanating from the crowd did not trigger any arrests—despite the fact that everyone was standing on federal land. Across the city there have been regular cannabis seed-and-food giveaways, which have gone largely unopposed by local authorities. Clubs have sprung up offering in-home gardening services for those who want to cultivate their own plants.

Some of the thin ice under the cannabis economy occasionally gives way. Earlier this year the proprietor of Kush Gods pleaded guilty to marijuana distribution. Yet within days of being ordered to shut down his company and the app through which he made contact with “donors”, the firm’s cars could again be seen soliciting donations across the city.

Delta lives

Standin' at the crossroads

CLARKSDALE, MISSISSIPPI

The mayor of the hometown of the blues is a man of many parts

BILL LUCKETT was already in his 60s when his acting career took off. He was mooching around film sets and premières, and the parts began rolling in. He has played a judge, a chef, a restaurateur and a newscaster, and has forthcoming roles as a pick-up driver and a homeless man. His melodious southern accent may help. So might the fact that, as a professional trial lawyer, "I've been an actor a long time."

Mr Lockett was introduced to the film business by his friend Morgan Freeman. They met 20-odd years ago when Mr Freeman was building a house in the Mississippi Delta, and Mr Lockett helped with both the paperwork and the construction: as well as a lawyer, he is an army-trained civil engineer (he was an officer in the Mississippi National Guard). The poorest part of America's poorest state, the Delta is a place where many people multi-task to get by; but, even here, Mr Lockett's versatility stands out. He is also a property developer, "two-bit contractor", "frustrated architect", sometime housepainter, landlord, handyman, motorcyclist and fisherman.

And nightclub-owner. He and Mr Freeman opened a high-end restaurant in Clarksdale in 2000; it closed a few years ago, though while it lasted, Mr Lockett says, they at least had somewhere good to eat themselves. They invested in a barbecue business over in Arkansas, which also folded. (They co-own several planes, too, and Mr Lockett flies them: he is a qualified jet pilot.) But Ground Zero, the blues bar they established in 2001, is still going. Back then there was nowhere reliably to hear the Delta's world-famous art form in its spiritual hometown. They fitted out Ground Zero to look like a juke joint, of the kind sharecroppers once patronised, which required old beer signs, Christmas lights and pool tables. The rampant graffiti dates to opening night, when a young woman danced on the bar and Mr Lockett drew the outline of her bare feet.

Ground Zero is next to the Delta Blues Museum, where the prize exhibit is the former slave cabin in which a young Muddy Waters lived, and close to the crossroads where, legend has it, Robert Johnson sold his soul to the devil. Mr Lockett is a gregarious presence. "How y'all doin'?" he asks each table of tourists as he works the room. "Where y'all from?" Fifteen years on, though, the club has yet to break even. But it has achieved another avowed aim, which was to spur Clarksdale's revival.

Compared with much of the rest of the Delta—a sultry plain punctuated by disused cotton gins and rusted petrol pumps, where the towns are as run-down as the soil and culture are rich—Clarksdale is humming. Once, says Mr Lockett, you could have fired a rifle in the evening and not hit anyone. Now there is live blues every night. Agricultural mechanisation means it is still a place people leave but, these days, some are moving in. For example, Robin Colonas, a merchant mariner from Seattle, has salvaged an open-air concert venue from the husk of an old cinema where Ike Turner was an usher (Sam Cooke was born next door).

Now, having galvanised Clarksdale's development, Mr Lockett is trying to boost it further through his other late-blooming career: as a groundbreaking politician.

Fell down on my knees

In 2013 he was elected Clarksdale's mayor. One of his opponents was the scion of a black political dynasty; another was tarnished by his fondness for a website called *sugardaddyforme.com*. A third was murdered during the campaign (for non-political reasons). In a city that is 79% black, Mr Lockett was variously assailed as "a white honky" and, ludicrously—given his lifetime membership of the NAACP—as a racist. "True or not, it doesn't matter in politics," he laments. But none of it washed, and, impressively for a white politician in the Delta, he won in a landslide.

When a statewide row broke out about Mississippi's flag, which includes the Confederate stars-and-bars, Mr Lockett took it down from city hall. Other challenges have ranged from the trivial—an official who, he says, expected the fire department to fill up his swimming pool, supporters who want him to "fix their [traffic] tickets"—to the critical. Clarksdale has been flooded twice in the past six months, once following a tornado. Crime remains worrying; Mr Lockett was caught up in it last year, when one of his legal clients fatally shot an adversary at a deposition. He says he still jumps at unexpected bangs. Above all, the blues can't feed everyone: 38% of Clarksdale's 17,000 residents still live in poverty. Many, says Ms Colonas, can't afford to visit the new venues, and lack the skills to work in them.

Mr Lockett hopes to attract film productions, for which Clarksdale's time-warped shopfronts may be a draw. But as he rages against Mississippi's woeful education system, he knows these blights demand bigger tools than a mayor can wield. And, in fact, he has run for higher office. In the governor's election of 2011 he made it to a Democratic primary run-off, losing, he believes, because of cynical Republican support for his less viable rival, who was then duly walloped. He didn't mind the mudslinging, but his law practice suffered and he disliked all the begging phone calls. "What it takes to get elected", he concludes, "is a lot of money."

Still, he hasn't ruled out another tilt, and likes to think the Democrats can still compete in Mississippi, with the right candidate. "Why are we a red state," he asks, "when we're the poorest state in the nation?" Meanwhile, he has the mayoralty and his proliferating acting gigs. In a scene he has just shot, for a film called "Kudzu Zombies", he plays a defeated politician in a place then overrun by monsters. ■



Bill Lockett: actor, bartender, lawyer, politician

Lexington | Playground tactics

Protesters who use violence against Donald Trump's supporters are doing his work



FOR those who long to see President Donald Trump in the White House, violent protests outside some recent Trump rallies, often in cities with big immigrant populations, prove that their hero cannot take power soon enough. For everyone else, such violence is a cause for alarm. Not only is it wrong, as a point of principle, for protesters to sucker-punch Trump supporters on live television. From a narrowly political perspective, history suggests that demagogues gain votes when unrest grips the streets. Sure enough, Mr Trump has carefully blamed trouble outside his rallies on “thugs” and “agitators...sent by the Democratic Party”. Mr Trump also takes pains to point out when protesters wave the Mexican flag, a gesture that feeds his habit of questioning the loyalty of American Hispanics (including Gonzalo Curiel, an Indiana-born federal judge whom Mr Trump, disgracefully, dubs a biased “Mexican” and who is hearing a lawsuit against him).

Still the protests keep coming. Recent weeks have seen violence outside Trump rallies in such west-coast cities as Costa Mesa and San Jose and, farther inland, in Albuquerque. Never mind that Mr Trump has in his day praised violence meted out by his backers—“I’d like to punch him in the face,” he said of a protester in February. Because the latest demonstrations look like a gift to Mr Trump, a gulf of bafflement has opened between those who hope to beat him at the ballot box and those who seem more eager to defeat him on the streets. To simplify, the first group watches the second abandoning the moral high ground and wonders: What are they thinking? Being a literal-minded sort, Lexington decided to find some of the flag-waving protesters and ask them. No single spokesman can sum up a protest movement. Still, pieces of the puzzle emerged from interviews with organisers and activists in southern California.

For a start, campaigners say that protesters are victims of aggression. Gabby Hernandez, an organiser with a Mexican-American rights group, Chicanos Unidos de Orange County, came to an interview on June 6th with her daughters, students at a mostly white high school in the affluent seaside city of Newport Beach. Her younger daughter, 15-year-old Alexia Alvarez, described how students have long led rather separate lives at school. But with Mr Trump in the news, 16-year-old Angelina describes segregation taking a nastier turn. Chalk graffiti appeared saying “Fuck Ille-

gals” and “Go Back to Mexico” in corners of the school where Hispanic pupils gather, while “Trump 2016” slogans appeared where whites hang out. Students began wearing Trump t-shirts to class. When the Alvarez sisters and four Hispanic peers wore “Dump Trump” t-shirts to school, the principal told them to change—officially to “prevent disturbances”—but later backed down.

On April 28th Ms Hernandez took her daughters to protest against a Trump rally in Costa Mesa, near their school. Angelina recognised classmates turning out for Mr Trump: “More kids than I would expect,” she says. “You lose friends.” Alexia is proud of a home-made sign reading: “If you’re ugly and you know it, vote for Trump”. But the whimsical mood did not last. Ms Hernandez found herself in shouting matches with grown men confronting her daughters. At one point, Ms Hernandez says, a 40-something, Trump-supporting woman hit one of her daughters’ teenage friends. She accuses the police of letting the woman walk off, and telling the protesters to file a report the next day.

In their interviews, the organisers do not deny that some protesters struck back. What they resist is any suggestion that anti-Trump demonstrators should share the blame if the businessman wins the election. “It is unfair to put it on us that we are enabling Trump,” says Ms Hernandez. More to the point, she says, Mr Trump is enabling whites to vent long-suppressed prejudices.

Carolyn Torres, a history teacher who also works with Chicanos Unidos, goes further. If protests hurt the Democratic Party, she says: “That is not our issue.” Ms Torres charges Mrs Clinton with supporting the deportation of Central American children fleeing violence and working with her husband, Bill Clinton, to pass crime bills that built a “prison-industrial complex”. As for Barack Obama, notes Ms Torres, deportations have reached record levels under his presidency. Asked if her cause might not gain from wooing moderate voters, she calls that “respectability politics”. Real change, she says, is not won by “nicely asking”.

What’s in a flag?

Nauí Huitzilopochtli, a school administrator and campaigner for indigenous Americans, recalls joining youths waving Mexico’s banner in 1994 during huge marches against Proposition 187, a Californian ballot initiative that sought to deny state services, including schooling, to undocumented immigrants. He waved the flag because his family was under attack, he says. He heard warnings that this was counter-productive and calls that a double-standard. When Jewish-Americans wave Israeli flags, he says, conservatives never say: “Why don’t you go back to Israel?” Mr Huitzilopochtli agrees that Mexican flags helped to pass Proposition 187, by angering white Californians. But in the long term, he argues, that historic defeat galvanised non-whites to vote and to enter politics: “I see the positive.”

Can Mrs Clinton head off more protests? Hairo Cortes, a student and organiser from Orange County Immigrant Youth United, took several activists to the Costa Mesa rally. Meeting in the city of Santa Ana on June 7th, over cups of cinnamon-infused *café de olla*, Mr Cortes spelled out the (politically impossible) policy Mrs Clinton would have to embrace to win his group’s support—to stop all, or almost all, deportations. Ultimately, Mr Cortes says his cause is larger than the next election. “Trump is dangerous,” he says. “But being better than Trump is not good enough.” The campaigners’ logic is clear enough: President Trump is not the worst that could happen. For their sakes, and America’s, hope the businessman never proves them wrong. ■



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Peru's election

The fortunate president

LIMA

Anti-Fujimorismo achieves an unlikely victory for an economic liberal

IT COULD hardly have been closer. As the final votes were counted in the run-off ballot for Peru's presidency, Pedro Pablo Kuczynski, a liberal economist, seemed to have defeated Keiko Fujimori by just 39,000 out of almost 18m votes, a margin of 0.2%. After months in which Ms Fujimori had led opinion polls, this was a surprising reversal. It shows how deeply divided Peru is about the legacy of Ms Fujimori's father, Alberto, who ruled it as an autocrat from 1990 to 2000; he is serving long prison terms for corruption and complicity in human-rights abuses.

With such a narrow mandate, Mr Kuczynski's first task when he takes office on July 28th will be to show that he can govern a country facing an economic slowdown and characterised by frequent social conflicts. It helps that he has few real policy differences with Ms Fujimori.

Fortune smiled on Mr Kuczynski throughout the race, with the force of the Andean sun. He was an unlikely victor. At 77, he is among the oldest presidential-election winners in Latin American history. He has alternated periods as an official in Peru—manager of the Central Bank in the 1960s, mining minister in the 1980s and economy and prime minister in the early 2000s—with long stints abroad: he studied at Oxford and Princeton, and worked at the World Bank and as a businessman and banker in the United States. His hired campaign guru resigned in despair at the candi-

date's lack of political instincts.

In February Mr Kuczynski's support in the opinion polls was 9% and falling. His chance came when the electoral authority disqualified two other candidates on technicalities. In the first ballot in April, he won just 21% of the vote, well behind Ms Fujimori's 40%. A week before the run-off vote on June 5th Ms Fujimori led by five points.

In the end strong anti-Fujimori sentiment brought Mr Kuczynski his razor-thin victory. Ms Fujimori is an effective grassroots campaigner. She built on her father's support among the poor, who remember his crushing of hyperinflation and terrorism, and his opening of schools and health clinics. But the other half of Peru abhors *Fujimorismo*, seeing it as the legacy of a corrupt dictatorship.

Wind at his back

Two things pushed Mr Kuczynski over the line. One was a last-minute, grudging endorsement by Verónica Mendoza, a defeated left-wing candidate. Second, the damage done by the revelation in May that the United States' Drug Enforcement Administration was investigating Joaquín Ramírez, the general secretary of Ms Fujimori's party, Popular Force, was magnified when Ms Fujimori took three days to suspend him. The affair seemed to bolster Mr Kuczynski's claim that, if his opponent won, Peru risked becoming a "narco-state".

The two candidates broadly agreed on

maintaining the free-market policies that have helped turn Peru into the fastest-growing of Latin America's larger economies in this century. But that will not make Mr Kuczynski's task much easier. Popular Force won 73 of the 130 seats in Peru's congressional election, also in April; the new president's party has only 18. Ms Mendoza's party was interested only in stopping Ms Fujimori, not in helping Mr Kuczynski.

With the mining boom of the 2000s fading, annual GDP growth has slowed, to 2.8% during the past two years. That is still healthy by regional standards. And growth might edge up in 2016, thanks to rising copper output from new mines. But labour-intensive industries, such as construction and manufacturing, are in recession.

Mr Kuczynski's plan to stimulate the economy focuses on tax cuts and public investment, especially in drinking water, sanitation and health care. His economic adviser, Alfredo Thorne, proposes to cut value-added tax from 18% to 15% and grant big companies a tax break on reinvestment. He says this will pay for itself by curbing evasion and encouraging Peru's vast array of informal businesses to go legal. He wants to promote formal jobs by cutting severance pay, replacing it with unemployment insurance for new hires.

Mr Kuczynski plans to run a fiscal deficit of up to 3% of GDP; because Peru's public debt is low and its credit rating strong, this can easily be financed, he says. Tax revenue would increase and the budget would be in balance by 2021, he argues. Others think the plan threatens economic stability. "It's very risky to go for such a big deficit when the results of tax cuts and formalisation are very uncertain," says Elmer Cuba, Ms Fujimori's economic adviser.

Another goal is to free up some \$22 billion in investment in mining and energy projects stalled by local opposition. The ►►

▶ new team proposes to raise public investment in the affected areas. It also needs to build on the efforts of Ollanta Humala, the outgoing president, to improve education, health and social protection. The other big issue is rising crime. Mr Kuczynski's security adviser, Gino Costa, wants to reform the national police, boosting its intelligence branch and integrating its operations more closely with municipal forces.

Mr Kuczynski's prospects turn partly on whether he can strike a deal with Popular Force on issues requiring legislation, such as taxes and reform of municipal water companies. The price of that might be to pardon Mr Fujimori, or at least grant him house arrest. That would be controversial. Carlos Bruce, a congressman in Mr Kuczynski's party, says the new president might offer Ms Fujimori's party cabinet posts.

For Ms Fujimori, a second narrow defeat will be hard to swallow. In 2011 Mr Humala, a former army officer running on a centre-left platform, beat her by three percentage points. This time she took more care to distance herself from her father, to no avail. *Fujimorismo* will not vanish, but it might split. Oddly, Ms Fujimori's brother Kenji, a congressman, failed to vote for her.

Peru is not easy to govern. Mr Humala will leave office isolated and unpopular. Ms Fujimori's criticism of Mr Kuczynski's team as elitist technocrats, out of touch with Peruvian life, carried much truth. Unless he finds some skilful political operators, fortune may cease to smile on him. ■

Corruption in Guatemala

Bad apples everywhere

An ousted president is accused of masterminding kleptocracy

WHEN Otto Pérez Molina resigned as Guatemala's president last September and was promptly jailed on corruption charges, it was seen as the ultimate triumph for the International Commission against Impunity in Guatemala (CICIG), a UN-backed body of independent prosecutors and investigators, many of them foreign. Now it seems the scandal that led to Mr Pérez's downfall—a kickback scheme at the customs agency—was just the tip of the iceberg. On June 2nd CICIG and local officials arrested 25 people and issued warrants for 27 more as they unveiled an accusation of jaw-dropping scope: Mr Pérez's entire political party had been a mere front for a plan to capture and run the Guatemalan state for personal enrichment.

Political parties have long been weak in Guatemala. Every president since 1985, when regular elections resumed, has be-

Canada's daunting logistics

Airships in the Arctic

OTTAWA

Dirigibles are being floated as the future mules of the great white north

EACH year around this time Craig and Cathy Welsh list all the food, drink, clothing and furniture they need for the next year. They then fly 2,000 km (1,250 miles) south to Ottawa from their home in Iqaluit, buy the non-perishables and put them on a ship that will call once the sea ice melts around July. Estimating quantities can be tricky: one bulk toothpaste purchase lasted more than eight years. Yet local prices are so high that they still save money.

Canada's transport network, like its people, is squeezed along its southern border. The Arctic depends on air freight, seasonal sea shipments and ice roads. Living costs are exorbitant, but building new infrastructure is even more so: the latest proposal, for a 7,000-km corridor of roads, pipelines and railways has a non-starter price tag of C\$100 billion (\$80 billion). Now, soaring above such unrealistic options, an old technology is being touted as a new solution: airships.

Also known as dirigibles or (without a rigid structure) blimps, their basic design hasn't changed in 150 years: a bag of lighter-than-air gas, plus a propulsion system. Airships fell out of fashion after the 1937 *Hindenburg* disaster, which killed 36 people, and all but vanished in the jet age. Now they are getting a long-overdue makeover. Dirigibles are far slower than planes: they max out at just 100kph (70mph). But they consume much less fuel and cost about half as much to make. They are also easier to fly in dense, cold air than in hotter, more turbulent southern climes, says Grant Cool, who markets them for Lockheed Martin.

Moreover, dirigibles do not need an airport to unload. One lighter-than-air model in development by LTA Aérostructures of Montreal would lower up to 70 tonnes of cargo to the ground, requiring only a mooring mast. A heavier-than-air hybrid from Lockheed Martin can land on any flat land or ice. John Laitin of Sabina Gold and Silver, a mining firm, says he paid C\$1.90 per tonne per km for

Arctic air freight in 2013. Airship makers say they could run that route for C\$1.07.

So why aren't airships already a fixture in the Arctic sky? Until recently, there was little need: remote towns and camps could safely rely on winter ice roads. But climate change now means these melt unpredictably. Another reason was high oil prices. Although expensive fuel increased airships' cost advantage over planes, the commodities boom boosted resource firms in the north. When it burst, these companies rushed to cut costs. A final factor is politics. The previous prime minister, Stephen Harper, was a fossil-fuel fan. His successor, Justin Trudeau, vows to tax carbon.

Nonetheless, it will take time for cargo airships to get off the ground. The 40 or so in the world today are all used for observation, tourism or advertising. The first mover is Britain's Hybrid Air Vehicles, which hopes to fly its Airlander at the Farnborough Air Show in July. Lockheed has built a scaled prototype, and signed a letter of intent with Straightline Aviation of Britain to supply 12 airships for \$480m. But Mr Welsh has learned to be patient. "I am looking out the window," he says, "and I still do not see any Zeppelins."



The answer to inflated prices?

longed to a different party, most of which are now defunct. So there was nothing unusual about Mr Pérez, a former general, founding the Patriotic Party (PP) in 2001 as a vehicle for his political ambitions.

But according to CICIG, by 2008 the PP was accepting illegal campaign contributions as down-payments for favours if it ever took power. The party courted donors, set up shell companies and appoint-

ed frontmen to run them, and covered its tracks with receipts for vague services like "use of machinery for 1,000 hours".

After Mr Pérez won the presidential election of 2011, the commission charges, he delivered on his promises. His government signed at least 450 contracts from which officials skimmed off more than \$65m as part of the scheme, while Mr Pérez and his vice-president, Roxana Baldetti, en- ▶▶



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joyed vacation homes, yachts, helicopters and designer clothing. The 58 named conspirators (counting those already in jail) come from virtually every part of the Guatemalan elite, including the former bosses of two large banks and the wife of a media magnate. An ex-football star who served as Mr Pérez's culture minister was also detained. In the words of Plaza Pública, a local news website: "The Patriotic Party wasn't a political party. In reality, it was a criminal gang whose objective was to take power to rob the state."

In the past, investigators confronting such entrenched power would have had

little hope of making such spectacular claims stick. But CICIG, which was set up in 2007 to aid the country's prosecutors, has a formidable record of obtaining hard evidence such as wiretaps and bank-transfer records. It has used these techniques not just to take down Mr Pérez, but also to solve murders and ferret out drug traffickers lurking among the police.

Moreover, Guatemala's own prosecutors have begun to absorb the foreigners' professionalism and fearlessness. Mr Pérez did not deny the allegations when asked by reporters, simply saying he would "listen to the charges", while Ms Baldetti has

not responded—though they both said they were innocent of the original customs-bribery allegations.

If CICIG, whose current mandate runs until late 2017, can secure convictions in the case, it would be a big step towards ending impunity in a country where the powerful have historically been above the law. At the same time, it would also confirm Guatemalans' suspicions about the extent of the rot at the heart of their state. Foreigners have proven indispensable in bringing corrupt politicians to book. But only Guatemalans can find some honest ones to replace them. ■

Bello | The Mexican blues

Intellectuals find fundamental flaws in the country's democracy

ON JUNE 5th voters in 12 Mexican states unexpectedly gave the Institutional Revolutionary Party (PRI) of President Enrique Peña Nieto a good kicking. In elections for governors, by a preliminary count, the PRI lost seven states to the conservative National Action Party (PAN). In four of those states, the PRI had never before lost power. "After 86 years in which they governed Veracruz, we beat the PRI," exclaimed Miguel Ángel Yunes, the PAN candidate in that state. This is how democracy is supposed to work: angry voters get to kick the bums out.

For Mexico, this is still a novelty. It was only in 2000 that seven decades of one-party rule by the PRI finally ended when Vicente Fox of the PAN won the presidency. Yet hopes of a deep and lasting transformation that Mr Fox's victory raised have given way to disillusion. In striking unison, several of the country's leading thinkers published jeremiads on the state of Mexican democracy last month.

"The goddess who was going to cure all evils gave birth to an unrecognisable creature which today prompts rejection and mistrust among the majority of Mexicans," wrote Héctor Aguilar Camín, a historian and novelist, in an essay in *Nexos*, a monthly journal. In *Letras Libres*, Enrique Krauze, another historian, declared in a similar vein: "Many of us thought that democracy... would bring an era of peace, prosperity and justice. That was naive."

This intellectual gloom contains a recognition that many things in Mexico are not going so badly. The economy is solid, if not stellar. A dozen of Mexico's 32 states, mainly in the north, are growing at Asian rates. Consumption has expanded steadily, as has home-ownership, and an open economy has brought Mexicans cheaper, better goods, as Luis Rubio, a political scientist, points out. These improvements

are being boosted by the structural reforms—of energy, the labour market, education, banking and telecommunications—launched by Mr Peña.

Such achievements are more than cancelled out in the public mind by two, linked, failings: crime and corruption. Mr Peña at first played down the battle against organised crime, but the murder rate is rising again and extortion is an everyday misery. According to *Latinobarómetro*, a nationwide poll, in 2015 57% of Mexican respondents said they or a relative had been a victim of crime in the past year, compared with 44% in the region as a whole. Crime routinely goes unpunished: only a quarter of murders are solved.

Corruption is equally ubiquitous. It costs Mexico as much as 10% of GDP, according to a study by IMCO, a think-tank. From 2000 to 2013 41 state governors were implicated in corruption scandals; only two have been jailed. In a horror that still shocks Mexico, crime and corruption came together in the murder in 2014 of 43 student teachers in the state of Guerrero at the hands of local police, politicians and drug traffickers.



It has become commonplace to say that in Mexico democracy did not bring the rule of law. But why did it not? The answer lies in a largely unreformed political system. Under one-party rule, it was a top-down affair based on an imperial presidency. Instead of a systematic redesign, Mr Fox's victory brought fragmentation and institutional decay. Since 2000 no president has had a majority in Congress. Mr Aguilar notes that power and much federal money have passed to state governors, with no oversight. The cost of politics has rocketed, he adds: office is auctioned to the highest bidder, repaid by siphoning public money and bribes from contractors, developers and organised crime. Freed from the tutelage of the presidency, many local governments fail to fight crime, writes Mr Krauze.

Mexicans are fed up with crime and corruption; fairly or not, they blame the unpopular Mr Peña. He acknowledged recently that society is "ill-humoured". But Mexico's constitution does not provide for a presidential run-off; PRI strategists have calculated that they can keep power in 2018 with just 30% or so of the vote.

The gubernatorial elections should shake them out of their complacency. Some Mexicans believe that political alternation at the state level is the key to progress. Others argue that the country needs deeper political reform. At a minimum, this should include some recentralisation, with a stronger federal police force and more control over public funds; genuine autonomy and accountability of prosecutors and the courts; and steps to cut the cost of politics. A fragmented political system needs a mechanism to produce a majority, such as a run-off. The problem is that in democracies it is easier to kick the bums out than to devise ways to stop them getting in in the first place.



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South Korea's working women

Of careers and carers

SEOUL

Conservative workplaces are holding South Korean women back

WHEN Moon Su-jong, a web designer at a mid-sized South Korean *chaebol*, or conglomerate, joined a late-night company booze-up and declined alcohol, her bosses guessed that she was pregnant. (What other reason could there be for not drinking?) Far from congratulating her, they were outraged. They berated her for burdening her colleagues, who would have to shoulder her work in her absence, and asked her when she would quit.

Ms Moon complained to the human-resources manager, who agreed that she was harming the company by getting pregnant. Her boss added that the firm should hire more men. She quit five months later. She left her next employer, too, after her second baby. Her mother-in-law was no longer able to help out with the child care, so Ms Moon went freelance.

Such experiences are so common in South Korea that they are the subject of a new television drama, "Working Mum, House Daddy". Its spunky protagonist, Mi-so, struggles to combine long, rigid work hours with child care. She loses out on a promotion to a colleague whose mother-in-law looks after her grandchild (South Koreans call this a "mum lifeline").

Women in South Korea find it hard to juggle family and a career. In a poll of 3,000 firms last year, over 80% of private ones said that only one-third of female employees returned to work after maternity leave. Public policy is not the problem. South Ko-

rean law requires that private companies offer one year of paid maternity leave. Park Geun-hye, the first woman to lead an East Asian country when she assumed South Korea's presidency in 2013, has vowed to create 1.7m jobs for women, lift their employment rate by seven percentage points, to 62%, and name and shame companies with too few female employees.

But many South Koreans are reluctant to accept that women have careers, and firms often fail to accommodate the needs of working mothers. The share of working-age South Korean women who have jobs

crept above 50% in 2000, and has risen only five percentage points in the past two decades. The gap between the median earnings of men and women in full-time employment is the worst in the OECD, a group of mostly rich countries (see chart). It has shrunk by just three percentage points in ten years. Working women are paid only 63% of what working men get. The few female bosses in its ten biggest *chaebol* are all relatives of one of their main shareholding families.

Some South Koreans argue that men need jobs more than women, since they are the chief breadwinners. Man of Korea, a male-rights group, wants to abolish the country's Ministry of Gender and Family, which it says oppresses men, for example by creating women-only parking spaces.

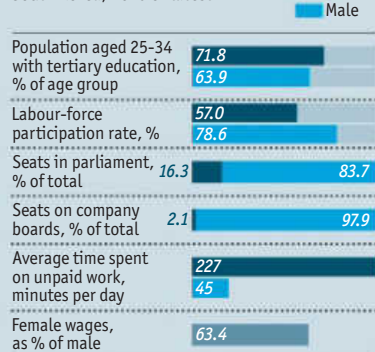
That South Korea now has men's-rights groups is a sign that women have made advances—the stubblier sex no longer takes its dominance for granted. As recently as 1990, sex-selective abortions stemming from a Confucian preference for sons meant that 117 boys were born for every 100 girls. Girls often left school and took menial jobs to support their brothers' education. Now the cultural preference has reversed: more parents say they would prefer daughters, and the sex ratio at birth is normal again. Three-quarters of women go to university, compared with just two-thirds of men.

But the workplace has been slow to adapt, and huge numbers of capable female candidates are being overlooked or sidelined. A survey of human-resources teams by Saramin, a job-seeking portal, found that one-third of firms had rejected female job applicants who were at least as well qualified as the male candidates. One-third of respondents agreed that "only a man could do the job."

Women have started to fight back. In ►►

No-career women in Korea

South Korea, 2016 or latest



Sources: OECD; Inter-Parliamentary Union; MSCI

Interactive: Compare the best and worst countries to be a working woman Economist.com/glassceiling

▶ January an employee at a brewery in the conservative city of Daegu sued her boss for forcing her to resign before her marriage. And foreign firms in South Korea have seen an opportunity. Since female talent is undervalued, it is relatively cheap. A study in 2010 found that foreign multinationals hire lots of South Korean women with degrees, and that this boosts their return on assets.

One way to make it easier for working mothers would be for their husbands to do more at home. Currently South Korean women do 83% of unpaid work; American women do 62%. The law promotes a fairer division of labour: South Korean fathers are entitled to 53 weeks of paid paternity leave—more than any others in the OECD. Yet barely 2% used any of it in 2014. An architect in Seoul (who asked not to be named) took a full year off work so that his wife could pursue her “dream job” in one of the country’s biggest publishing firms, but he is exceptional. (At his wife’s firm, her female colleagues brag about how their contractions started while they were still at their desks.)

Many fathers—64% of male employees

surveyed in 2014—said they would share the burden of child care if only it became socially acceptable and financially possible (by law they are paid 40% of their regular wage on leave but, as it is capped at 1m won—\$860—a month, they rarely get that much). They know their bosses mean it when they joke that their desks might be gone when they return.

With a fertility rate of around 1.2 babies per woman, South Korea’s labour force is set to shrink dramatically. If the country fails to make use of half its talent pool, stagnation looms. An OECD study estimated that if the labour-force participation rate for men and women was the same by 2030, GDP growth would increase by 0.9 percentage points annually. Since 2010 growth has fallen from 6.5% to 2.6%.

In one episode of “Working Mum, House Daddy”, the office is dumbfounded when Mi-so’s husband comes into work with their second baby strapped to his chest and says he will take leave in her place to avoid her losing her job. The boss is incredulous: “Do you think this will end with you? Once you do this, others will follow!” Maybe they will. ■

scheme to build energy and transport infrastructure through the length of Pakistan, linking China to the sea.

On June 4th Mr Modi stopped in Afghanistan to inaugurate a hydroelectric station. One of numerous Indian aid projects, it is intended not only to shore up Afghanistan’s Western-backed government, but also to show off India’s generous, responsible behaviour, in contrast with that of another neighbour, Pakistan, whose intelligence services have long been accused of covertly sponsoring the Taliban.

From Afghanistan he went to Switzerland, America and Mexico. His aim in these countries was to put the seal on what has been a long and complicated Indian diplomatic effort. India has been trying for decades to gain international recognition as a nuclear state. It will soon gain entry to the 34-nation Missile Technology Control Regime (MTCR), whose aim is to keep irresponsible countries from acquiring missiles with which to deliver weapons of mass destruction.

But despite its good record in preventing nuclear proliferation (unlike Pakistan), and in the acceptance of international safeguards on civilian nuclear power, India remains shut out of the 48-nation Nuclear Suppliers Group (NSG). Non-membership is humiliating to a country of India’s size. It is also costly, denying India access both to useful civilian technology and to markets in which to sell its own.

Hoping to woo India a decade ago, America broke ranks and signed a bilateral accord on civilian nuclear power. The superpower also wielded its clout in 2008 to coax the NSG, and particularly a recalcitrant China, to grant limited exemptions for nuclear-technology trade with India. Now, under Mr Modi, India is stepping up its efforts to gain full admission to the nuclear elite. It sees the two meetings of the NSG that are due to be held later this month as an opportunity for progress.

Switzerland and Mexico are among the ▶▶

Indian diplomacy

Modi on the move

DELHI

Once diffident, India is beginning to join the dance

NARENDRA MODI is a masterful salesman. On his frequent foreign tours the Indian prime minister touts his brand not only in words but physically. The beatific smile, the warm hugs and the trademark folkloric dress project the reassuring humility of a big but benign country. Yet behind the soft-focus India that Mr Modi personifies, the contours of a harder-edged regional power are emerging under his leadership.

For many Indians, it is about time. Traditional Indian diplomacy has been “non-aligned”. In practice this has often meant disengagement from the wider world and skittish caution closer to home. Such has been the case in India’s dealings with China: its generous economic and military aid to Pakistan, India’s eternal rival, and its energetic efforts to prise smaller neighbours such as Nepal and Sri Lanka from India’s orbit have until recently resulted in little more than head-scratching in the Indian capital, Delhi. C. Raja Mohan of the Carnegie Endowment for International Peace, a think-tank, says there has been a shift in Indian diplomatic thinking: “Now the word is: ‘We will push back.’”

Mr Modi has signalled this on his recent

travels. Last month saw him in Iran where, between cuddly photo-sessions with similarly grizzled Iranian leaders, India pledged to develop port and rail links between Iran and Afghanistan. It is no coincidence that this route, which will ease traffic between Central Asia and the Arabian Sea, runs parallel to China’s own \$46 billion



India joins the clubs

Japan and money politics

Shameless shogun

TOKYO

Japan fondly recalls a corrupt former prime minister

IT WAS a favourite boast of the late Kakuei Tanaka, a former leader of Japan, that he won his first cabinet job in 1957 by giving the then prime minister, Nobusuke Kishi, a small backpack filled with ¥3m (perhaps \$70,000 in today's money). As Tanaka's stature in Japanese politics grew, so did the size of his bribes: eventually he needed large metal suitcases. Two years after he resigned as prime minister in 1974, following accusations of dodgy property deals, he was arrested for pocketing \$1.8m in bribes (\$8.7m today) from America's Lockheed Corporation, a defence contractor.

Forty years on, Japan is gripped by nostalgia for Kaku-san, as he is fondly known. A slew of recent books and articles lionise him. In this year's "Genius", a bestselling book about Tanaka written in the first person, as if he were still alive and doling out construction contracts, Shintaro Ishihara, a retired right-wing politician and former Tokyo governor, argues that politicians nowadays just lack his class. Others praise his common touch and ability to get things done: he was known as "the bulldozer with a computer". An editor at one of the Japanese tabloids that have been churning out articles praising Kaku-san believes his readers would vote for him if he were alive today.

What does this mania for a dead, corrupt politician say about contemporary Japan? Mainly it highlights the Japanese public's profound disenchantment with today's careful politics and bland politicians. Contemporary leaders, writes Eiji Oshita, an author, are "tasteless like distilled water".

It suggests a particular distaste for the current prime minister, Shinzo Abe, who is Kishi's grandson, and unlike Kaku-san often struggles to connect with ordinary



Kaku-san paid cash

folk. Akira Nakano, an 87-year-old businessman from Tokyo who recently bought Mr Ishihara's book, dislikes Mr Abe but complains that there is no viable opposition to vote for.

The mania also shows that Japan has a deep tolerance for bribery scandals, especially those involving popular politicians. *Jitsuwa Bunka Taboo*, which is better known for nude pictures and gossip about gangsters, was among the few publications to bring up Kaku-san's corruption. Of all the greedy politicians who had a knack for lining up supporters, it wrote, Tanaka was the worst. The more common view is Mr Ishihara's: that was how politics worked back then, and Kaku-san was an effective politician. Few may want to live in such times, but many miss them, and the characters they bred.

▶ smaller powers that had looked askance at India's efforts. But now they, along with traditionally nuclear-averse countries such as Japan, back Indian membership of the NSG. Italy dropped objections to Indian entry into the MTCR after India sent home an Italian marine facing murder charges for killing two Indian fishermen he mistook for pirates.

China worries about signs that Western countries are cosy up to its giant neighbour. It fears that Mr Modi will exploit better ties with America as a source of advantage. For years the Pentagon has pursued India as part of an effort to counterbalance

growing Chinese strength, but only in recent months have Indian military officials begun to show eagerness for co-operation. This month the two countries will hold their annual naval exercises not in Indian waters, but in the Sea of Japan, with the Japanese navy, near islands claimed by both Japan and China. In a wide-ranging speech before a joint session of Congress on June 8th, Mr Modi said that America was India's "indispensable partner". An outright military alliance between India and America remains unlikely, but even the remote prospect of one will concentrate Chinese minds. ■

Afghanistan-Pakistan relations

Frontier stand-off

ISLAMABAD

Why Pakistan has tightened controls along a porous border

FOR more than a century, travellers, traders, tribesmen and the occasional terrorist have wandered freely across the Afghanistan-Pakistan border. That came to an abrupt end on June 1st. For the first time, Pakistan imposed full border controls at Torkham near the Khyber Pass, used by around 15,000 people daily. This is sure to cause hardship for the 40m Pushtuns living on both side of the border. It also shows how regional power dynamics are shifting.

Despite the government's warning, people were surprised—many did not even have passports to hold their newly required visas. One traveller reported seeing pregnant women lying by the road, desperate to get to a hospital in Peshawar, on the Pakistan side. Commerce will also suffer. Peshawar's private hospitals rely on fees from a steady stream of Afghan patients. Afghan carpets are really Afghan-Pakistani carpets: woven in Afghanistan, but usually cut, cleaned and sold in Pakistan.

For Afghanistan, the closure inflames the old wound over the Durand Line, which defines the border. The line was agreed in 1893 between the then-king of Afghanistan and the British Raj. It sliced through Pushtun communities. Afghanistan still refuses to recognise it, or give up claims to a big chunk of Pakistani territory.

Some Afghans believe the border closure is intended to punish them. The goodwill following Ashraf Ghani's election as president of Afghanistan has ebbed. His term began with a charm offensive: he sent cadets for officer training in Pakistan, called on Pakistan's army chief in Islamabad, and dropped a longstanding request for Indian military aid, including attack helicopters. But after a series of Taliban attacks he has returned to the anti-Pakistan rhetoric typical of Afghan politicians; he accuses Pakistan of sponsoring and sheltering Taliban leaders.

Pakistan, meanwhile, has taken umbrage at India's rising influence in Afghanistan. Minimising the old enemy's presence on its western flank has long been an obsession for Pakistani leaders. Narendra Modi, India's prime minister, opened Afghanistan's new parliament building in December. On June 4th he inaugurated a restored dam near the western city of Herat. India financed both structures.

In May Messrs Modi and Ghani, along with Hassan Rohani, Iran's president, struck a partnership to develop Iran's Chabahar port (see previous story). The port ▶▶



A slower crossing

War in Afghanistan

The general's words

Barack Obama faces an unpleasant decision

THIS week General John Nicholson, the commander of America's forces in Afghanistan, completed a review of what will be needed to contain the growing insurgent threat posed by the Taliban and its allies. After reading his recommendations, Barack Obama will have to make a decision he surely hoped to pass on to the next president: whether to ramp up American troop numbers in Afghanistan again.

General Nicholson has probably asked Mr Obama at least to halt his planned reduction of America's troop levels from 9,800 to 5,500 by the end of the year. Mr Obama has often seemed to think he could end the war in Afghanistan simply by declaring it over. But the enemy has not cooperated. Afghan forces have fought bravely since the end of 2014, when NATO combat troops formally left. But they were not ready to cope with the sudden departure of their allies, while the Taliban remained resilient and capable.

The Afghans are suffering losses that American commanders warn are unsustainable (see table). Not since 2001 have the Taliban held as much territory as they now do. Civilian casualties are mounting, as Afghan soldiers have been stretched thin across multiple fronts. Michael O'Hanlon of the Brookings Institution, a think-tank, says that the loss of American air power has particularly hampered the Afghan army's ability to carry out attacks: units in trouble can no longer call in reinforcements or air strikes.

Even current troop levels—6,954 Americans to train and help Afghan forces and 2,850 on separate counter-terrorism missions, with NATO contributing a further 5,859 soldiers—appear inadequate. Mr Obama's administration understands this, at least tacitly. The House Armed Services Committee recently revealed that 26,000 military contractors are in Afghanistan—an unusually high number. They do a lot of jobs that troops would normally do, allowing Mr Obama to hold the headline figure for troops deployed below 10,000.

Nor is it just a question of numbers: what the White House lets its soldiers do also matters. American special forces go discreetly into action with their Afghan counterparts. But most troops in the "train and assist" mission are not embedded with Afghan combat units, where they would be in harm's way but also of most practical help.

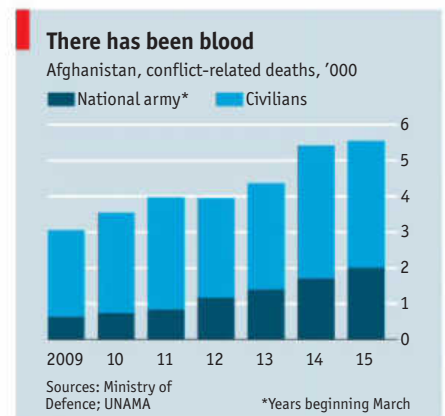
Restrictions on air power are even more

frustrating for field commanders. American combat aircraft may only be used against designated terrorist groups, such as al-Qaeda and Islamic State, or when either NATO troops are imperilled or "strategic collapse is imminent" (for example, if a big city is about to be captured).

Few can see the sense of this. David Petraeus, a former commander in Afghanistan, and Mr O'Hanlon recently urged Mr Obama to change the rules of engagement. They pointed out that America is dropping and firing 20 times more bombs and missiles in Iraq and Syria (neither especially intense air campaigns) than in Afghanistan. Anthony Cordesman of the Centre for Strategic and International Studies says that "US and allied air power is critical" to prevent the Afghan army's defeat.

To bolster his case, General Nicholson points to "overt cooperation between the Taliban and designated terrorist organisations". He fears that if the Taliban returned to power in some parts of the country, "they would offer sanctuary to these groups." He already has the bipartisan support of 10 of the 26 members of the Senate Armed Services Committee, who wrote to Mr Obama on May 26th urging him to give General Nicholson's advice "extraordinary weight". On June 3rd, 13 senior diplomats and retired generals, who oversaw military operations and policy in Afghanistan under both the Bush and Obama administrations, sent the president an open letter calling on him to maintain current force levels.

Whatever Mr Obama decides, his successor will still have to make some difficult choices. It would be better if those choices were informed by sober realism rather than wishful thinking. ■



▶ project will compete with Pakistan's China-backed port in Gwadar, just 170km east of Chabahar. A retired Pakistani defence secretary reflected establishment views when he told a conference that the Chabahar development represented a "security threat to Pakistan".

Pakistan's building of fences and fortifications has triggered cross-border skirmishing in the past. And it has periodically shut the border when it wanted to express annoyance at Afghanistan. On May 10th the border was closed for four days after Afghan forces blocked Pakistan's efforts to erect border fencing. But this time passport controls look set to become permanent. Officials promise to extend them to the six other border crossings in due course.

Pakistan's army insists that tighter controls are a security measure, unrelated to the region's power politics. The army believes that three terrorist attacks in and near Peshawar, including the gruesome slaughter of more than 130 boys at the city's Army Public School, involved terrorists who had freely crossed into the country at Torkham. Some in Pakistan have even started to question the "easement rights" granted to tribes divided by the border, maintaining that they were intended to let tribesmen travel short distances across the border, not have unfettered access to all of Pakistan. Demands that Afghan refugees, some of whom have lived in Pakistan since the Soviet invasion of the 1980s, return home have grown louder.

The potential damage to cross-border trade and diplomatic relations does not bother Pakistan's defence establishment, says Rahimullah Yousafzai, a Peshawar-based watcher of frontier affairs. "Pakistan is going to be much less big-hearted than before," he predicts. ■

Banyan | Foreign lives

Migrant labour brings enormous economic benefits, and wrenching heartache



EATING chips in a Singapore McDonald's with his press clippings proudly spread in front of him, Mohammed Mukul Hossine is revelling in his status as a published poet. The 25-year-old Bangladeshi's day job is working on the piling for a new block of luxury flats. With a father back home undertaking the *haj* this year, and one of his eight siblings still in school, he needs the money. His book of poems, "Me Migrant", which he paid to have translated from Bengali to English, and which were then "trans-created" by Cyril Wong, a Singaporean poet, will not be a bestseller. But it has drawn some attention to a large, often overlooked slice of Singapore's population: its 1m "work permit" holders—migrant workers on two-year contracts. The poems suggest, unsurprisingly, that their lives are pretty miserable.

The International Labour Organisation estimates that the Asia-Pacific region was host in 2013 to 25.8m migrant workers. They have done wonders for both their home and destination countries. Rapidly ageing societies such as Japan, Singapore, South Korea and Taiwan are short of workers. Younger, poorer places such as Bangladesh, India, Nepal and the Philippines need the money their emigrants send home. So Cambodians work on South Korean farms; young Chinese men work in Tokyo's convenience stores; and South Asians toil on Singapore's building sites. The World Bank estimates that of the ten countries that receive the most in remittances from overseas workers, five are in Asia. In the Philippines, remittances are equal to 10% of GDP.

In Singapore 1.4m workers, or 38% of the workforce, are foreigners on time-limited passes. Most come without their families. Many of the 326,000 construction workers live in dormitories; the 232,000 domestic workers live in their employers' homes. Many can repeatedly renew their two-year contracts. But they are given virtually no hope of becoming "permanent residents"—as other long-staying foreigners can—let alone Singaporean citizens. Women who become pregnant are sent home; workers who overstay are caned and deported ("law and order so accurate here," notes one of Mr Mukul's poems in praise of "beloved Singapore"). Some politicians say that, since their stays are limited and they impose little burden on local infrastructure, pass-holders should not really be counted as part of the population at all.

Some of course suffer exploitation and misfortune. Mr Mu-

kul's first visit to Singapore in 2008 came after his father had sold land to pay the S\$10,000 (\$7,400) fee demanded by job agents in Bangladesh. But his employer went bust and he had to return home penniless. It is a typical story, says Jolovan Wham of HOME, a charity that works with migrant workers. Singapore limits agents' fees to two months' wages, but cannot police what happens in the home countries. So many workers toil for months to repay their debts. If they fall ill, are injured or find themselves in dispute with their employers, they have few resources, though local NGOs help—it was through one, HealthServe, that Mr Mukul found the cash to have his book published.

His book is not full of anger (despite one poem in which he declares "I want to announce war.") Rather it is about homesickness, missing his family—especially his mother—and the isolation of the migrant's life. His own favourite is called simply "Loneliness", and finishes: "Stranded immigrant, unending solitude." In this Mr Mukul is also typical: he is far from the only migrant worker-poet; and that loneliness reflects the preoccupations of many others: missing spouses, and children growing up not knowing one parent; thwarted romances; lost homes.

Though literature is particularly central to Bengali culture, workers from many nations have taken up writing. Shivaji Das, a Singapore-based writer and management consultant, helps organise poetry competitions in Singapore and Malaysia with entries in Chinese, Tagalog, Bahasa Indonesia, Tamil as well as Bengali. A winner from last year's contest in Singapore was N. Rengarajan, a 29-year-old construction worker from southern India, whose poem on the pluses and minuses of migrant life sums up many of the recurring themes. Translated from the Tamil, it concludes: "Living in a foreign land/ we can buy everything that has a price/ but love and affection./ Ours is not a foreign life/ our lives are foreign to us."

In Singapore, migrant workers rarely make the news. When they do, it is sometimes for a good deed noted by a politically correct pro-government organ. But many in Singapore were shaken when, in December 2013, a traffic accident in the part of town known as Little India degenerated into a riot, as South Asian migrants vented their frustrations. And in the past few months, another sort of story has appeared: of the pre-emptive arrests and sometimes deportation of a few "radicalised" Bangladeshis plotting terrorist attacks at home.

Twenty years of schoolin', and they put you on the day shift

Mr Das notes that the reaction of many people to the poetry is surprise. Migrants can write! They even have emotions! So it not only gives those who are interested a platform and a chance to share their work and their feelings. It also helps to change public attitudes. Singapore is a sought-after and hence expensive destination for migrants, compared with, say, the Middle East. So some who come are well educated and even, at home, comfortably off. They are, through self-selection, adventurous and ambitious. Unenviable though their lives in Singapore seem, many are there through repeated choices, suggesting both the lack of opportunity they felt at home, and that Singapore's treatment of migrants is seen as better than most.

Mr Mukul, a high-school graduate who has been writing songs and poetry since he was 12, found construction work hard, fainting on the fourth day of his first job, humping sacks of cement. Yet he keeps coming and keeps writing, and now dreams the impossible dream: of becoming Singaporean. ■

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Wenzhou's economy

It once was lost

WENZHOU

A city renowned for its business acumen battles to recover from a financial crisis

DEBT in China can be life-threatening. Walking around the factory floor of his father's company, a manufacturer of small electrical parts, Fan Lele looks relaxed these days. Five years ago, he could not come near it. After a few investments went bad, he found himself 10m yuan (\$1.5m) in arrears to his creditors, many of whom were former friends. Mr Fan feared they might hurt or even kill him, so he went into hiding for months, skipping from city to city. Eventually, his father dug deep to pay them off. He secured Mr Fan's safe return and managed, barely, to keep his company afloat.

In this eastern city, home to some of China's boldest risk-takers, such tales are almost banal. Virtually everyone in business in Wenzhou, which is to say almost everyone in Wenzhou, has a horror story about the financial crisis that struck in mid-2011. Dozens of investors, big and small, fled their debts. The most desperate jumped off buildings. Large, unlicensed underground banks collapsed, as did hundreds of firms. By official (very conservative) reckoning property prices fell some 25% over the next few years (see chart).

These days, Wenzhou is quietly getting back to work. Housing prices have started to rise again. The city's economic growth topped 8% last year, the fastest since 2011. But with bad loans still clogging its bank system, many of the city's scars remain unhealed. Wenzhou is an outlier at the wild end of the Chinese economy. Yet its trajectory—from painful downturn to halting re-

covery—may suggest what lies ahead for the most debt-laden parts of the country.

Wenzhou has long stood apart from the rest of China. It is a port city in Zhejiang province, separated from the interior by mountains, with a dialect unintelligible to most outsiders. The legacy of foreign missionaries in the 19th century is evident in a large Christian community (Wenzhou is sometimes called the "Jerusalem of the East"). When China began to open up to private commerce in the 1980s, Wenzhou was one of the first to seize the new opportunities. Its people became renowned for their aggressive brand of capitalism, and also their golden touch.

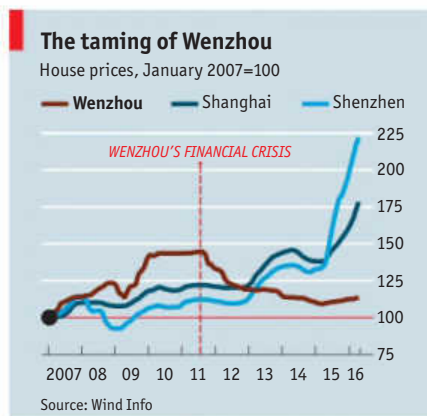
Families pooled their cash and organised informal lending societies, backed by the trust born of their tight-knit community. With that capital, they started small fac-

tories. By the late 1990s Wenzhou had become a manufacturing centre for a dizzying array of small products: from cigarette lighters to valves. As Wenzhouese fanned out around the country for business, their money followed. Whenever asset prices spiked, whether for holiday homes on the southern island of Hainan or coal mines in the industrial north, Chinese media pointed to speculators from Wenzhou as the cause. These accounts often contained a kernel of truth.

Then came 2011. China had propelled its economy through the global financial crisis by flooding it with cash. Regulators were starting to rein in the excesses. Across the nation, lending to small businesses slowed; property prices and the stock-market dipped. Companies in Wenzhou, which had been counting on a steady flow of financing to fund their bets on stocks and property, were in trouble. The dense networks of trust that had helped propel Wenzhou to wealth turned into liabilities. By the end of 2011 at least 40 small-business owners had reneged on their debts and fled the city, police said at the time. Mr Fan was one of them.

Five years on, Wenzhou is still trying to clean up the mess. In 2012, to much fanfare, the central government designated the city as a "special financial zone". The idea was to bring transparency to underground banking. It set up a "registration centre" at which lenders were urged to declare their loans so that it would be easier to monitor them. By April, about 32 billion yuan in loans had been registered at the centre—a good start, but less than 5% of official bank lending in Wenzhou. It is likely that many underground loans are still hidden.

The city also gave private businesses the right to establish lending companies, trying to steer them into the formal financial system. These have fared poorly. One businessman says he and his partners are closing up shop after less than two years. ▶▶



▶ He estimates that about 20% of their 200m yuan in loans has already gone bad. “The government said it was reform,” he sighs. “But we wonder if they were just lying to us, getting companies to take our loans to pay back state banks.”

There has been progress in other areas, however. One is bankruptcy, a legal process that has been slow to catch on in China (hence bitter disputes when firms go bust). The central government introduced a new law in 2007 allowing the restructuring of troubled companies, using methods similar to Chapter 11 proceedings in America. Businesses in other parts of China, fearing a stigma, have been reluctant to use it. Courts have lacked expertise to administer it. But Wenzhou has got over its inhibitions. With less than 1% of China’s GDP, it has accounted for nearly a tenth of bankruptcy cases nationwide over the past three years. It established one of China’s first courts dedicated to handling such cases. “Other cities hear ‘bankruptcy’ and get scared. Here, we are tasting how sweet it can be,” says Zhou Guang, who heads the Wenzhou Lawyers’ Association.

In one case held up by the city as a model, Haihe, a drug firm with a history going back to 1670, was salvaged after going bust. Its previous owners had run up unsustainable debts punting on property. Its creditors took control and eventually sold it to investors. The lenders only managed to recover a small portion of what they were owed but, crucially from Wenzhou’s perspective, Haihe is back in business. It now has plans to expand.

State-run banks also appear to be healthier. They say that nearly 5% of their loans were bad in early 2014; at the end of last year, 3.8% were. That is still more than double the national average and probably an understatement, since banks regularly hide their bad loans. Part of the clean-up also reflects an asset shift rather than a real solution: Wenzhou is the first city in China to create its own “bad bank” to take over failed loans. But these caveats aside, the city is justifiably proud. It is just about the only city in China where banks have reported an improvement in lending quality over the past two years.

Even the city’s underground lenders—at least those still in business—have learned lessons. Yan Yipan has transformed his law firm into an intermediary that connects borrowers and creditors, helping to structure legally binding deals between them. From a stylish wood-clad tea room in his office, he says that the city offers a glimpse of what awaits the rest of the country as growth slows and debt-laden companies sputter. “Wenzhou was the first to fall into trouble but it is also the first to get back up again,” he says. “When the economy was going well, no one thought there could ever be problems. Now we are much more rational.”

Yet the prevailing mood is gloomier than before the crisis. At Mr Fan’s company, Tietong, the concern is not loan sharks but rather the problems of small businesses anywhere in China. A manufacturer of metal wiring for light switches, Tietong is squeezed between rising wage costs and falling demand amid an industrial slowdown. To survive, it has been trying to break into new markets. It has recognised that its products are not good enough for rich countries, so it is focusing on developing ones—only to find that its prices are often too high for them. That is a common experience in Wenzhou, where the economy is dominated by small businesses like Mr Fan’s.

Wenzhou’s identity as a relatively independent, easy-going city has also started to fade. In the past two years, officials in Zhejiang have been waging their biggest crackdown on open displays of Christian belief in years. This has involved the demolition of several churches and the removal of

hundreds of rooftop crosses from others, with Wenzhou a main target. At some churches, Christians have protested and scuffled with police. The chill has extended to the city’s business atmosphere: provincial and central officials now watch Wenzhou more closely. That may be reasonable, given the turmoil of 2011, but it is a change nonetheless.

There has also been a loss of trust between people themselves. Zhang Xiaoyan, an adviser to the local government, says the “spiritual damage” from the crisis is worse than the material damage. “It used to be that Wenzhouese would lend to each other with no questions asked and not even so much as an IOU. It was like a blood bond. This is no more,” she says. In place of the trust-based system, the city is trying to foster a modern economy based on contracts and credit records. If successful, Wenzhou may well emerge more resilient, though nothing like its former rumbustious self. ■

China-United States relations

Aerial chicken

BEIJING

A rocky patch could get rockier

BARACK OBAMA’S “pivot” to Asia has been his most important foreign-policy shift. But the continent is causing him more pain than gain, at least to judge by the final cabinet-level meeting of his presidency between China and America. The gathering, called the Strategic and Economic Dialogue, was held in Beijing on June 6th and 7th. It showed that some progress is being made by the mutually suspicious powers. But it has been only tentative. Remaining problems are intractable and dangerous.

In one friendly-sounding gesture, China pledged to cut excess steel production, which has been depressing global prices and upsetting steelmakers in America and elsewhere. But the country had already said it would reduce capacity by 100m-150m tonnes by 2020. China admits this will not eliminate the glut.

China also agreed to enforce sanctions that were imposed on North Korea by the UN in March. That would please America, which believes China is half-hearted about stepping up pressure on the North to stop making nuclear bombs. But the two countries showed little sign of agreeing on what to do next. America wants more pressure, China more talks.

Tension at the meeting was inevitable. An international tribunal is preparing to rule soon on rival claims by the Philippines (an American ally) and China in the South China Sea. China will be furious if, as is expected, the ruling favours



What the hell ADIZ?

the Philippines. It says it will not abide by the verdict, and is reported to be planning to declare an Air Defence Identification Zone (ADIZ) in the South China Sea. This would require planes to identify themselves, or face a military response.

On his way to Beijing, America’s secretary of state John Kerry (pictured, with President Xi Jinping) warned against the ADIZ idea. During his talks, in a reminder of the risks involved, Chinese fighter jets buzzed an American spy plane in the ADIZ that China already has in the East China Sea. The Pentagon called the interception “unsafe”. That would also apply to the relationship more generally.



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Factory fresh

If agriculture is to continue to feed the world, it needs to become more like manufacturing, says Geoffrey Carr. Fortunately, that is already beginning to happen

TOM ROGERS is an almond farmer in Madera County, in California's Central Valley. Almonds are delicious and nutritious. They are also lucrative. Californian farmers, who between them grow 80% of the world's supply of these nuts, earn \$11 billion from doing so.

But almonds are thirsty. A calculation by a pair of Dutch researchers six years ago suggested that growing a single one of them consumes around a gallon of water. This is merely an American gallon of 3.8 litres, not an imperial one of 4.5 litres, but it is still a tidy amount of H₂O. And water has to be paid for.

Technology, however, has come to Mr Rogers's aid. His farm is wired up like a lab rat. Or, to be more accurate, it is wireless up. Moisture sensors planted throughout the nut groves keep track of what is going on in the soil. They send their results to a computer in the cloud (the network of servers that does an increasing amount of the world's heavy-duty computing) to be crunched. The results are passed back to the farm's irrigation system—a grid of drip tapes (hoses with holes punched in them) that are filled by pumps.

The system resembles the hydroponics used to grow vegetables in greenhouses. Every half-hour a carefully calibrated pulse of water based on the cloud's calculations, and mixed with an appropriate dose of fertiliser if scheduled, is pushed through the tapes, delivering a precise sprinkling to each tree. The pulses alternate between one side of the tree trunk

and the other, which experience has shown encourages water uptake. Before this system was in place, Mr Rogers would have irrigated his farm about once a week. With the new little-but-often technique, he uses 20% less water than he used to. That both saves money and brings kudos, for California has suffered a four-year-long drought and there is social and political, as well as financial, pressure to conserve water.

Mr Rogers's farm, and similar ones that grow other high-value but thirsty crops like pistachios, walnuts and grapes, are at the leading edge of this type of precision agriculture, known as "smart farming". But it is not only fruit and nut farmers who benefit from being precise. So-called row crops—the maize and soyabeans that cover much of America's Midwest—are being teched up, too. Sowing, watering, fertilising and harvesting are all computer-controlled. Even the soil they grow in is monitored to within an inch of its life.

Farms, then, are becoming more like factories: tightly controlled operations for turning out reliable products, immune as far as possible from the vagaries of nature. Thanks to better understanding of DNA, the plants and animals raised on a farm are also tightly controlled. Precise genetic manipulation, known as "genome editing", makes it possible to change a crop or stock animal's genome down to the level of a single genetic "letter". This technology, it is hoped, will be more acceptable to consumers than the shifting of whole genes between species that underpinned early

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ANIMAL HUSBANDRY

Stock answers

TOWARDS 2050

Vorsprung durch Technik



People will want to eat better than they do now

genetic engineering, because it simply imitates the process of mutation on which crop breeding has always depended, but in a far more controllable way.

Understanding a crop's DNA sequence also means that breeding itself can be made more precise. You do not need to grow a plant to maturity to find out whether it will have the characteristics you want. A quick look at its genome beforehand will tell you.

Such technological changes, in hardware, software and "liveware", are reaching beyond field, orchard and byre. Fish farming will also get a boost from them. And indoor horticulture, already the most controlled and precise type of agriculture, is about to become yet more so.

In the short run, these improvements will boost farmers' profits, by cutting costs and increasing yields, and should also benefit consumers (meaning everyone who eats food) in the form of lower prices. In the longer run, though, they may help provide the answer to an increasingly urgent question: how can the world be fed in future without putting irreparable strain on the Earth's soils and oceans? Between now and 2050 the planet's population is likely to rise to 9.7 billion, from 7.3 billion now. Those people will not only need to eat, they will want to eat better than people do now (see chart), because by then most are likely to have middling incomes, and many will be well off.

The Food and Agriculture Organisation, the United Nations' agency charged with thinking about such matters, published a report in 2009 which suggested that by 2050 agricultural production will have to rise by 70% to meet projected demand. Since most land suitable for farming is already farmed, this growth must come from higher yields. Agriculture has undergone yield-enhancing shifts in the past, including mechanisation before the second world war and the introduction of new crop varieties and agricultural chemicals in the green revolution of the 1950s and 1960s. Yet yields of important crops such as rice and wheat have now stopped rising in some intensively farmed parts of the world, a phenomenon called yield plateauing. The spread of existing best practice can no doubt bring yields elsewhere up to these plateaus. But to go beyond them will require improved technology.

This will be a challenge. Farmers are famously and sensibly sceptical of change, since the cost of getting things wrong (messing up an entire season's harvest) is so high. Yet if precision farming and genomics play out as many hope they will, another such change is in the offing. ■

Smart farms

Silicon Valley meets Central Valley

In various guises, information technology is taking over agriculture

ONE way to view farming is as a branch of matrix algebra. A farmer must constantly juggle a set of variables, such as the weather, his soil's moisture levels and nutrient content, competition to his crops from weeds, threats to their health from pests and diseases, and the costs of taking action to deal with these things. If he does the algebra correctly, or if it is done on his behalf, he will optimise his yield and maximise his profit.

The job of smart farming, then, is twofold. One is to measure the variables going into the matrix as accurately as is cost-effective. The other is to relieve the farmer of as much of the burden of processing the matrix as he is comfortable with ceding to a machine.

An early example of cost-effective precision in farming was the decision made in 2001 by John Deere, the world's largest manufacturer of agricultural equipment, to fit its tractors and other mobile machines with global-positioning-system (GPS) sensors, so that they could be located to within a few centimetres anywhere on Earth. This made it possible to stop them either covering the same ground twice or missing out patches as they shuttled up and down fields, which had been a frequent problem. Dealing with this both reduced fuel bills and improved the uniformity and effectiveness of things like fertiliser, herbicide and pesticide spraying.

Since then, other techniques have been added. High-density soil sampling, carried out every few years to track properties such as mineral content and porosity, can predict the fertility of different parts of a field. Accurate contour mapping helps indicate how water moves around. And detectors planted in the soil can monitor moisture levels at multiple depths. Some detectors are also able to indicate nutrient content.

All of this permits variable-rate seeding, meaning the density of plants grown can be tailored to local conditions. And that density itself is under precise control. John Deere's equipment can plant individual seeds to within an accuracy of 3cm. Moreover, when a crop is harvested, the rate at which grains or beans flow into the harvester's tank can be measured from moment to moment. That information, when combined with GPS data, creates a yield map that shows which bits of land were more or less productive—and thus how accurate the soil and sensor-based predictions were (see chart, next page). This information can then be fed into the following season's planting pattern.

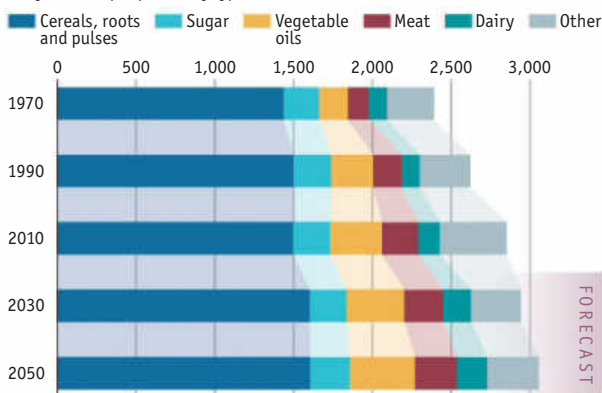
Farmers also gather information by flying planes over their land. Airborne instruments are able to measure the amount of plant cover and to distinguish between crops and weeds. Using a technique called multispectral analysis, which looks at how strongly plants absorb or reflect different wavelengths of sunlight, they can discover which crops are flourishing and which not.

Sensors attached to moving machinery can even take measurements on the run. For example, multispectral sensors mounted on a tractor's spraying booms can estimate the nitrogen needs of crops about to be sprayed, and adjust the dose accordingly. A modern farm, then, produces data aplenty. But they need interpreting, and for that, information technology is essential.

Over the past few decades large corporations have grown up to supply the needs of commercial farming, especially in the Americas and Europe. Some are equipment-makers, such as John Deere. Others sell seeds or agricultural chemicals. These look like getting larger still. Dow and DuPont, two American giants, are planning to ▶▶

What's on the world's menu

Daily calories per person by type of food



Source: FAO



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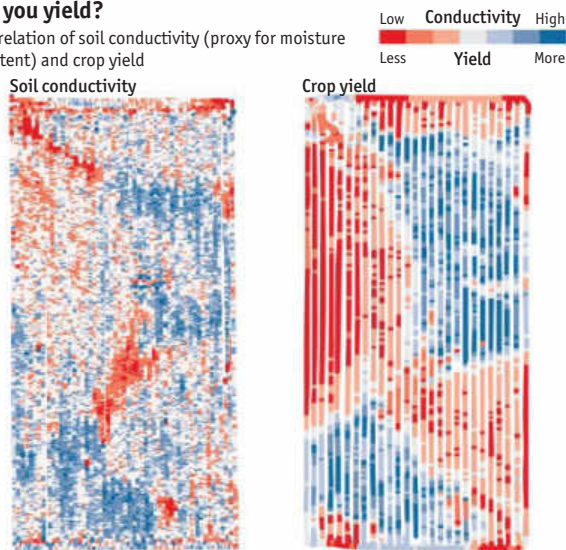
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Do you yield?

Correlation of soil conductivity (proxy for moisture content) and crop yield



Source: University of Nebraska

► merge. Monsanto, another big American firm, is the subject of a takeover bid by Bayer, a German one. And Syngenta, a Swiss company, is being bid for by ChemChina, a Chinese one.

Business models are changing, too. These firms, no longer content merely to sell machinery, seed or chemicals, are all trying to develop matrix-crunching software platforms that will act as farm-management systems. These proprietary platforms will collect data from individual farms and process them in the cloud, allowing for the farm's history, the known behaviour of individual crops strains and the local weather forecast. They will then make recommendations to the farmer, perhaps pointing him towards some of the firm's other products.

But whereas making machinery, breeding new crops or manufacturing agrochemicals all have high barriers to entry, a data-based farm-management system can be put together by any businessman, even without a track record in agriculture. And many are having a go. For example, Trimble Navigation, based in Sunnyvale, at the southern end of Silicon Valley, reckons that as an established geographical-information company it is well placed to move into the smart-farming market, with a system called Connected Farms. It has bought in outside expertise in the shape of AGRITREND, a Canadian agricultural consultancy, which it acquired last year.

By contrast, Farmobile of Overland Park, Kansas, is a startup. It is aimed at those who value privacy, making a feature of not using clients' data to improve its products, as many farm-management systems do. Farmers Business Network, of Davenport, Iowa, uses almost the opposite model, acting as a co-operative data pool. Data in the pool are anonymised, but everyone who joins is encouraged to add to the pool, and in turn gets to share what is there. The idea is that all participants will benefit from better solutions to the matrix.

Some firms focus on market niches. iTRK,

based in Montpellier, France, for example, specialises in grapes and has built mathematical models that describe the behaviour of all the main varieties. It is now expanding into California.

Thanks to this proliferation of farm-management software, it is possible to put more and more data to good use if the sensors are available to provide them. And better, cheaper sensors, too, are on their way. Moisture sensors, for example, usually work by measuring either the conductivity or the capacitance of soil, but a firm called WaterBit, based in Santa Clara, California, is using a different technology which it says can do the job at a tenth of the price of the existing products. And a sensor sold by John Deere can spectroscopically measure the nitrogen, phosphorous and potassium composition of liquid manure as it is being sprayed, permitting the spray rate to be adjusted in real time. This gets round the problem that liquid manure, though a good fertiliser, is not standardised, so is more difficult than commercial fertiliser to apply in the right quantities.

Things are changing in the air, too. In a recapitulation of the early days of manned flight, the makers of unmanned agricultural drones are testing a wide range of designs to find out which is best suited to the task of flying multispectral cameras over farms. Some firms, such as Agribotix in Boulder, Colorado, prefer quadcopters, a four-rotored modern design that has become the industry standard for small drones, though it has limited range and endurance. A popular alternative, the AgDrone, built by HoneyComb of Wilsonville, Oregon, is a single-engine flying wing that looks as if it has escaped from a 1950s air show. Another, the Lancaster 5, from PrecisionHawk of Raleigh, North Carolina, vaguely resembles a scale model of the eponymous second-world-war bomber. And the offering by Delair-Tech, based in Toulouse, France, sports the long, narrow wings of a glider to keep it aloft for long periods.

Even an endurance drone, though, may be pushed to survey a ►►

Bugs in the system

Bacteria and fungi can help crops and soil

MICROBES, though they get a bad press as agents of disease, play a beneficial role in agriculture. For example, they fix nitrogen from the air into soluble nitrates that act as natural fertiliser. Understanding and exploiting such organisms for farming is a rapidly developing part of agricultural biotechnology.

At the moment, the lead is being taken by a collaboration between Monsanto and Novozymes, a Danish firm. This consortium, called BioAg, began in 2013 and has a dozen microbe-based products on the market. These include fungicides, insecticides and bugs that liberate nitrogen, phosphorous and potassium compounds from the soil, making them soluble and thus easier for crops to take up. Last year researchers at the two firms tested a further 2,000 microbes. The top-performing strains boosted maize and soyabean yields by about 3%.

In November 2015 Syngenta and DSM, a Dutch company, formed a similar partnership, and earlier that year, in April, DuPont bought Taxon Biosciences, a

Californian microbes firm. Hopeful startups abound. One is Boston-based Indigo, whose researchers are conducting field tests of some of its library of 40,000 microbes to see if they can alleviate stress induced by drought and salinity in cotton, maize, soyabeans and wheat. Another is Adaptive Symbiotic Technologies, of Seattle. The scientists who set up this firm study fungi that live symbiotically within plants. They have found one, whose natural partner is a grass, which confers drought-, heat- and salinity-resistance when transferred to crops such as maize, rice and wheat.

The big prize, however, would be to persuade the roots of crops such as wheat to form partnerships with nitrogen-fixing soil bacteria, much as legumes such as soyabeans do. In legumes, the plants' roots grow special nodules where the bacteria in question live. If wheat rhizomes could be encouraged, by genomic breeding or genome editing, to behave likewise, the benefits for everyone except fertiliser companies would be enormous.



WHAT HAPPENS WHEN

PROCESS

meets

perfect



Fruit processor makes the most of cherries in Michigan.

Shoreline Fruit LLC, located in northwest Lower Michigan, is the largest tart cherry operation in North America, spanning nearly 7,000 acres of cherry orchards and a 137,000-square-foot production facility. Most recently, Shoreline developed CherryPURE®, a nutraceutical supplement produced with the leftover cherry skins from the juicing process. “It’s made from 100% tart Montmorency cherries, proven to be a rich source of powerful antioxidant flavonoids which promote health and recovery benefits,” said CEO John Somavilla. Which shows how you can make the most of any business in Pure Michigan.



The farmhands of tomorrow

▶ large estate in one go. For a synoptic view of their holding, therefore, some farmers turn to satellites. Planet Labs, a firm in San Francisco, provides such a service using devices called CubeSats, measuring a few centimetres across. It keeps a fleet of about 30 of these in orbit, which it refreshes as old ones die by putting new ones into space, piggybacking on commercial launches. Thanks to modern optics, even a satellite this small can be fitted with a multispectral camera, though it has a resolution per pixel of only 3.5 metres (about ten feet). That is not bad from outer space, but not nearly as good as a drone's camera can manage.

Satellite coverage, though, has the advantage of being both broad and frequent, whereas a drone can offer only one or the other of these qualities. Planet Lab's constellation will be able to take a picture of a given bit of the Earth's surface at least once a week, so that areas in trouble can be identified quickly and a more detailed examination made.

The best solution is to integrate aerial and satellite coverage. That is what Mavrx, also based in San Francisco, is trying to do. Instead of drones, it has an Uber-like arrangement with about 100 light-aircraft pilots around America. Each of the firm's contracted planes has been fitted with a multispectral camera and stands ready to make specific sorties at Mavrx's request. Mavrx's cameras have a resolution of 20cm a pixel, meaning they can pretty much take in individual plants.

The firm has also outsourced its satellite photography. Its raw material is drawn from Landsat and other public satellite programmes. It also has access to these programmes' libraries, some of which go back 30 years. It can thus check the performance of a particular field over decades, calculate how much biomass that field has supported from year to year and correlate this with records of the field's yields in those years, showing how productive the plants there have been. Then, knowing the field's biomass in the current season, it can predict what the yield will be. Mavrx's method can be scaled up to cover entire regions and even countries, forecasting the size of the harvests before they are gathered. That is powerful financial and political information.

A truly automated, factory-like farm, however, would have to cut people out of the loop altogether. That means introducing robots on the ground as well as in the air, and there are plenty of hopeful agricultural-robot makers trying to do so.

At the University of Sydney, the Australian Centre for Field Robotics has developed RIPPA (Robot for Intelligent Perception and Precision Application), a four-wheeled, solar-powered device that identifies weeds in fields of vegetables and zaps them individually. At the moment it does this with precise, and precisely aimed, doses of herbicide. But it, or something similar, could instead use a beam of microwaves, or even a laser. That would allow the crops concerned to be recognised as "organic" by customers who disap-

prove of chemical treatments.

For the less fussy, Rowbot Systems of Minneapolis is developing a bot that can travel between rows of partly grown maize plants, allowing it to apply supplementary side dressings of fertiliser to the plants without crushing them. Indeed, it might be possible in future to match the dose to the plant in farms where individual plants' needs have been assessed by airborne multispectral cameras.

Robots are also of interest to growers of fruit and vegetables that are currently picked by hand. Fruit-picking is a time-consuming business which, even though the pickers are not well rewarded, would be a lot faster and cheaper if it were automated. And robot pickers are starting to appear.

The SW6010, made by AGROBOT, a Spanish firm, uses a camera to recognise

strawberries and work out which are ripe for the plucking. Those that are have their stems severed by blades and are caught in baskets before being passed on by a conveyor belt for packing by a human operator sitting on the robot. In the Netherlands, researchers at Wageningen University are working on a robot harvester for larger produce such as peppers.

All these devices, and others like them, still exude a whiff of the Heath Robinson. But robotics is developing rapidly, and the control systems needed to run such machines are getting better and cheaper by the day. Some think that in a decade or so many farms in rich countries will be largely robot-operated.

Yet others wonder just how far farmers will let their farms be robotised. Self-guiding agricultural machinery such as that sold by John Deere is all but robotic already. It is like an airliner, in which the pilot usually has little to do between landing and take-off because computers do the work for him. Yet Deere has no plans to hand over complete control to the cloud, because that is not what its customers want.

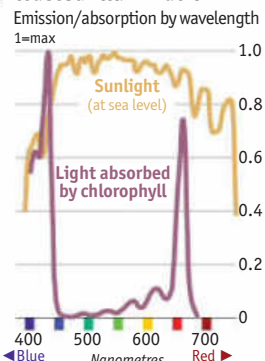
Tunnel vision

If total control still seems some way off in outdoor farming, it is already close for crops grown in an entirely artificial environment. In a warren of tunnels beneath Clapham, in south London, Growing Underground is doing exactly what its name suggests. It is rearing around 20 types of salad plants, intended for sale to the chefs and sandwich shops of the city, in subterranean voids that began life as second-world-war bomb shelters.

In many ways, Growing Underground's farm resembles any other indoor hydroponic operation. But there is one big difference. A conventional greenhouse, with its glass or polycarbonate walls, is designed to admit as much sunlight as possible. Growing Underground specifically excludes it. Instead, illumination is provided by light-emitting diodes (LEDs). These, in the minimalist spirit of hydroponics, have had their spectra precisely tuned so that the light they emit is optimal for the plants' photosynthesis.

As you would expect, sen-

Wasted illumination



Chlorophyll absorbs blue and red light. Modern LEDs can be tuned to provide only these, so that all of their output is used for photosynthesis.

Sources: University of Queensland; *The Economist*

sors watch everything—temperature, humidity, illumination—and send the data directly to Cambridge University’s engineering department where they are crunched, along with information on the plants’ growth, to work out the best regimes for future crops.

For now Steven Dring, Growing Underground’s boss, is confining output to herbs and vegetables such as small lettuces and samphire that can be brought to harvestable size quickly. He has reduced the cycle for coriander from 21 to 14 days. But tests suggest that the system also works for other, chunkier crops. Carrots and radishes have already been successfully grown this way, though they may not command a sufficient premium to make their underground cultivation worthwhile. But pak choi, a Chinese vegetable popular with trendy urbanites who live in inner-London suburbs like Clapham, is also amenable. At the moment growing it takes five weeks from start to finish. Get that down to three, which Mr Dring thinks he can, and it would be profitable.

The firms that make the LEDs could also be on to a good thing.

Mr Dring’s come from Valoya, a Finnish firm. In Sweden, Helipectra is in the same business. Philips, a Dutch electrical giant, has also joined in. In conventional greenhouses such lights are used to supplement the sun, but increasingly they do duty in windowless operations like Mr Dring’s. Though unlike sunlight they do not come free, they are so efficient and long-lasting that their spectral advantages seem clinching (see chart, previous page).

This kind of farming does not have to take place underground. Operations like Mr Dring’s are cropping up in buildings on the surface as well. Old meatpacking plants, factories and warehouses the world over are being turned into “vertical farms”. Though they are never going to fill the whole world’s bellies, they are more than a fad. Rather, they are a modern version of the market gardens that once flourished on the edge of cities before the land they occupied was swallowed by urban sprawl. And with their precise control of inputs, and thus outputs (see Brain scan, below), they also represent the ultimate in what farming could become. ■

Brain scan | Caleb Harper

The founder of the Open Agriculture Initiative at MIT’s Media Lab is building a “catalogue of climates” to help plants grow better

PLANT breeders are understandably excited about manipulating botanical genomics (see next page). But it is a crop’s phenotype—its physical instantiation—that people actually eat, and this is the product of both genes and environment.

Optimising phenotypes by manipulating the environment is the task Caleb Harper has set himself. Dr Harper is the founder of the Open Agriculture Initiative (OAI) at the Massachusetts Institute of Technology’s Media Lab. At first sight, that seems odd. The Media Lab is an information-technology laboratory, best known for having helped develop things like electronic paper, wireless networks and even modern karaoke machines. It is very much about bits and bytes, and not much hitherto about proteins and lipids.

However, environmental information is still information. It informs how a plant grows, which is what interests Dr Harper. As he once put it, “people say they like peppers from Mexico. What they actually like is peppers grown in the conditions that prevail in Mexico.” He reckons that if you can replicate the conditions in which a botanical product grew, you can replicate that product. But this means you have to understand those conditions properly in the first place.

To help with this, he and his colleagues at the OAI have developed what they call the Personal Food Computer: a standardised tabletop device that can control illumination, carbon-dioxide levels, humidity, air temperature, root-zone temperature, and the acidity and dissolved-oxygen content of water delivered to the roots, as well as its nutrient content and

any other aspect of its chemistry.

Plant phenotypes are monitored during growth by web cameras linked to software and by sensors that can detect areas of active photosynthesis. After harvesting they are examined by lidar (the optical equivalent of radar) to record their shape in detail, and by gas chromatography/mass spectroscopy to understand their chemical composition.

The idea is that Personal Food Computers can be built by anyone who chooses to, and form part of an “open science” network that gathers data on growing conditions and works out those conditions’ phenotypic effects. Of particular interest are matters such as flavour and astringency that are governed by chemicals called secondary metabolites. These are often parts of plant-defence mechanisms, so in one experiment the computers are looking at the effect of adding crushed arthropod exoskeletons to the water supply, which may mimic attack by insects or mites. The hope is that this will change flavours in controllable ways.

Though Dr Harper is from a rural background, his career before the OAI was conventionally Media Lab-like. In particular, he designed environmental-control systems for data centres and operating theatres—keeping heat, humidity and so on within the tight limits needed for optimal function. But the jump from controlling those environments to controlling miniature farms was not enormous.

Some three dozen Personal Food Computers already exist and about 100 more are under construction the world over. This geographical dispersion is important.



Dr Harper’s goal is to decouple climate from geography by building a “catalogue of climates”. That would allow indoor urban farms to be programmed to imitate whatever climate was required in order to turn out crops for instant local consumption. This would certainly appeal to those who worry about “food miles”—the cost in terms of carbon dioxide of shipping edible items around the world. How it will go down with farmers in places whose climates are being imitated in rich-country cities remains to be seen.

Crops of the future

Tinker and tailor

Farms need better products. Improved genomic understanding will provide them

C4 SOUNDS like the name of a failed electric car from the 1970s. In fact, it is one of the most crucial concepts in plant molecular biology. Plants have inherited their photosynthetic abilities from bacteria that took up symbiotic residence in the cells of their ancestors about a billion years ago. Those bacteria's descendants, called chloroplasts, sit inside cells absorbing sunlight and using its energy to split water into hydrogen and oxygen. The hydrogen then combines with carbon dioxide to form small intermediate molecules, which are subsequently assembled into sugars. This form of photosynthesis is known as C₃, because these intermediates contain three carbon atoms. Since the arrival of chloroplasts, though, evolution has discovered another way to photosynthesise, using a four-carbon intermediate. C₄ photosynthesis is often more efficient than the C₃ sort, especially in tropical climates. Several important crops that started in the tropics use it, notably maize, millet, sorghum and sugar cane.

C₄ photosynthesis is so useful that it has evolved on at least 60 separate occasions. Unfortunately, none of these involved the ancestors of rice, the second most important crop on Earth, after wheat. Yet rice, pre-eminently a tropical plant, would produce yields around 50% bigger than at present if it took the C₄ route. At the International Rice Research Institute in Los Banos, outside Manila, researchers are trying to show it how.

The C₄ Rice Project, co-ordinated by Paul Quick, is a global endeavour, also involving biologists at 18 other laboratories in Asia, Australia, Europe and North America. Their task involves adding five alien enzymes to rice, to give it an extra biochemical pathway, and then reorganising some of the cells in the plant's leaves to create special compartments in which carbon dioxide can be concentrated in ways the standard C₃ mechanism does not require. Both of these things have frequently happened naturally in other plants, which suggests that doing them artificially is not out of the question. The team has already created strains of rice which contain genes plucked from maize plants for the extra enzymes, and are now tweaking them to improve their efficacy. The harder part, which may take another decade, will be finding out what genetic changes are needed to bring about the compartmentalisation.

The C₄ Rice Project thus aims to break through the yield plateaus and return the world to the sort of growth rates seen in the heady days of the Green Revolution. Other groups, similarly motivated, are working on making many types of crops resistant to drought, heat, cold and salt; on inducing greater immunity to infection and infestation; on improving nutritional value; on making more efficient use of resources such as water and phosphorous; and even on giving to plants that do not have it the ability to fix nitrogen, an essential ingredient of proteins, directly from the air instead of absorbing it in the form of nitrates. Such

innovations should be a bonanza. Unfortunately, for reasons both technical and social, they have so far not been. But that should soon change.

The early days of genetically engineered crops saw two huge successes and one spectacular failure. The successes were the transfer into a range of plants, particularly maize, soyabean and cotton, of two types of gene. Both came from bacteria. One protected its host from the attentions of pesky insect larvae. The other protected it from specific herbicides, meaning those herbicides could be used more effectively to keep fields free from weeds. Both are beloved of farmers.

The spectacular failure is that neither is beloved of consumers. Some are indifferent to them; many actively hostile. Even though over decades there has been no evidence that eating genetically modified crops is harmful to health, and little that they harm the environment, they have been treated as pariahs.

Since people do not eat cotton, and soyabean and maize are used mainly as animal fodder, the anti-GM lobby's impact on those crops has been muted. But the idea of extending either the range of crops modified or the range of modifications available has (with a few exceptions) been thought commercially too risky to try. Moreover, transgenics, as the technique of moving genes from one species to another is called, is haphazard. Where the moved gene will end up is hard to control. That matters, for genes work better in some places than others.

Spell it for me

The search has therefore been on for a better way than transgenics of doing things. And one is now emerging that, its supporters hope, may kill both the technical and the social birds with a single stone. Genome editing, as this approach is known, tweaks existing DNA in situ by adding, subtracting or substituting a piece that may be as small as a single genetic "letter" (or nucleotide). That not only makes the technique precise, it also resembles the natural process of mutation, which is the basis of the variety all conventional plant-breeding relies on. That may raise fewer objections among consumers, and also holds out the hope that regulators will treat it differently from transgenics.

After a couple of false starts, most researchers agree that a technique called CRISPR/Cas9, derived from a way that bacteria chop up the genes of invading viruses, is the one that will make editing crop genomes a realistic prospect. Transgenic technology has steered clear of wheat, which is eaten mainly by people. But Du-▶▶



Looking for better cassava



Kyushu Electric Power Co., Inc.'s new 300,000-kilowatt-hour NAS storage array, supplied by NGK Insulators, Ltd., helps balance supply and demand amid Kyushu's surging growth in solar generation. (NAS photo courtesy of Kyushu Electric)

NAS Batteries—*Making Renewables More Renewable*

Fulfilling the potential of renewable energy sources will depend heavily on ensuring steady output. Large-capacity storage batteries hedge power grids against the output fluctuations inherent to wind and solar generation. Thus are power industry eyes worldwide focused on a massive battery installation completed this March in Japan's Fukuoka Prefecture.

The new battery installation, supplied through Mitsubishi Electric Corporation, is at Kyushu Electric's Buzen Power Station. Its storage capacity, at 300,000 kilowatt-hours (kWh), is enough to serve 30,000 households. At the heart of the installation are sodium-sulfur (NaS) batteries supplied by NGK Insulators. NGK is the world's only commercial supplier of NaS batteries, which the company markets under the brand name NAS®.

NGK, established in 1919, is a leading supplier of electrical insulators, ceramic substrates for automotive catalytic converters, and ceramic components and equipment for the electronics industry, as well as grid-scale storage batteries. It began developing NAS batteries in

cooperation with Tokyo Electric Power Co., Inc., in 1984 and began marketing the batteries, which incorporate leading-edge NGK expertise in ceramics, commercially in 2002.

Compelling Advantages

Heading the list of NAS advantages are long discharge time, six hours and more, and long life, rated at 15 years. The batteries' advantages also include high energy density and high charge-discharge efficiency. NAS batteries are economical, too, since their principal materials—sodium, sulfur, and ceramic—are plentiful and inexpensive.

NGK's new container configuration allows for deploying NAS batteries quickly and easily to accommodate the rapid growth in renewable power generation. That was especially important to Kyushu Electric, which was racing to keep up with surging growth in solar generation in Kyushu. And the power utility's huge, 300,000 kWh installation was in place just six months after NGK received the order.

A Prototype for California

NGK delivered the first NAS system outside Japan in 2006: an installation at an American Electric Power site in West Virginia for storing power during off-peak hours. The global array of NAS

installations has since grown rapidly as users have adopted the systems for diverse needs.

Interest in NAS technology is especially keen in California. The legislature there has passed legislation that calls for securing 50% of the state's electric power from renewables by 2030. That will result in occasional over-generation, since wind and solar generating facilities, unlike thermal power plants, cannot modulate their output.

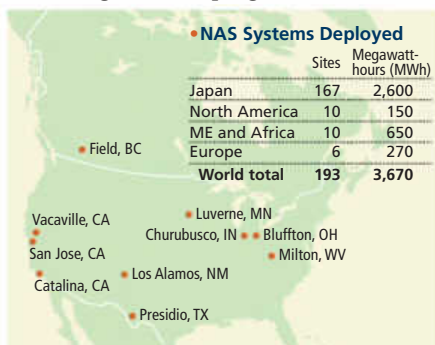
California will require massive storage capacity to keep the power generated at times of excess capacity from going to waste. And the state's three largest utilities face a legal mandate to add 1.3 gigawatts of storage capacity by 2020. Kyushu's evolving power mix is analogous to California's. So Kyushu Electric's new storage installation could well be a harbinger of things to come in the Golden State.

Exciting Prospects

The global market for stationary storage batteries presently centers on installations for providing short-term discharge of up to about two hours. Demand for long-term discharge capacity is poised to burgeon, however, as renewable power generation continues to grow and as users discover in NAS batteries an economical solution to their storage needs.

NGK is the world leader in storage battery installations for long-term discharge. It will continue to build on that leadership by promoting its NAS batteries in their easy-to-assemble container configuration.

NAS storage solutions
Optimizing the future of energy



NAS batteries store nearly 3,700 MWh (530 MW) of power at more than 190 sites worldwide, including 10 sites in North America.



Genome editing resembles the natural process of mutation

Pont's seed division, Pioneer, is already trying to use CRISPR/Cas9 to stop wheat from self-pollinating, in order to make the development of hybrids easier. Similarly, researchers at the Chinese Academy of Sciences are using it to try to develop wheat plants that are resistant to powdery mildew, a serious hazard.

Not all current attempts at agricultural genome editing use CRISPR/Cas9. Cibus, in San Diego, for example, employs a proprietary technique it calls the Rapid Trait Development System (RTDS). This co-opts a cell's natural DNA repair mechanism to make single-nucleotide changes to genomes. RTDS has already created one commercial product, a form of rape resistant to a class of herbicides that conventional transgenics cannot protect against. But at the moment CRISPR/Cas9 seems to be sweeping most things before it—and even if it stumbles for some reason, other bacterial antiviral mechanisms might step in.

Whether consumers will accept genome editing remains to be seen. No one, however, is likely to object to a second rapidly developing method of crop improvement: a souped-up breeding technique called genomic selection.

Genomic selection is a superior version of marker-assisted selection, a process which has itself been replacing conventional crop-breeding techniques. Both genomic selection and marker-assisted selection rely on recognising pieces of DNA called markers found in or near places called quantitative trait loci (QTLs). A QTL is part of a genome that has, because of a gene or genes within it, a measurable, predictable effect on a phenotype. If the marker is present, then so is the QTL. By extension, a plant with the marker should show the QTL's phenotypic effect.

The difference between conventional marker-assisted selection and the genomic version is that the former relied on a few hundred markers (such as places where the DNA stuttered and repeated itself) that could be picked up by the technology then available. Now, improved detection methods mean single-nucleotide polymorphisms, or SNPs (pronounced "snips"), can be used as markers. A SNP is a place where a single genetic letter varies in an otherwise unchanging part of the genome, and there are thousands of them.

Add in the enormous amounts of computing power available to link SNPs with QTLs—and, indeed, to analyse the interactions between QTLs themselves—and the upshot is a system that can tell a breeder which individual plants are worth raising to maturity, and which should then be crossed with each other to come up with the best results.

Crop strains created this way are already coming to market. AQUAmax and Artesian are drought-tolerant strains of maize developed, respectively, by DuPont and Syngenta. These two, intriguingly, are competitors with another drought-tolerant maize strain, DroughtGuard, developed by Monsanto using the transgenic approach.

Genomic selection also offers opportunities for the scientific improvement of crops that seed companies usually neglect. The NextGen Cassava Project, a pan-African group, plans to zap susceptibility to cassava mosaic virus this way and then systematically to improve the yield and nutritional properties of the crop. The project's researchers have identified 40,000 cassava SNPs, and have now gone through three generations of genomic selection using them. Besides making cassava resistant to the virus, they also hope to double yields and to increase the proportion of starch (and thus the nutritional value) of the resulting strains. If modern techniques can similarly be brought to bear on other unimproved

crops of little interest to the big seed companies, such as millet and yams, the yield-bonuses could be enormous.

For the longer term, some researchers have more radical ambitions. A manifesto published last year by Donald Ort, of the United States Department of Agriculture's Agricultural Research Service, and his colleagues proposes not merely recapitulating evolution but actually redesigning the photosynthetic process in ways evolution has not yet discovered. Dr Ort suggests tweaking chlorophyll molecules in order to capture a wider range of frequencies and deploy the resulting energy more efficiently. He is also looking at improving the way plants absorb carbon dioxide. The result, he hopes, will be faster-growing, higher-yielding crops.

Such ideas are controversial and could take decades to come to fruition. But they are not fantastic. A combination of transgenics (importing new forms of chlorophyll from photosynthetic bacteria), genome editing (to supercharge existing plant enzymes) and genomic selection (to optimise the resulting mixture) might well be able to achieve them.

Those who see this as an unnatural, perhaps even monstrous approach to crop improvement should recall that it is precisely what happened when the ancestors of modern plants themselves came into existence, through the combination of a bacterium and its host and their subsequent mutual adjustment to live in symbiosis. It was this evolutionary leap which greened the Earth in the first place. That something similar might re-green it is at least worth considering. ■

Fish farming

Catch of the day

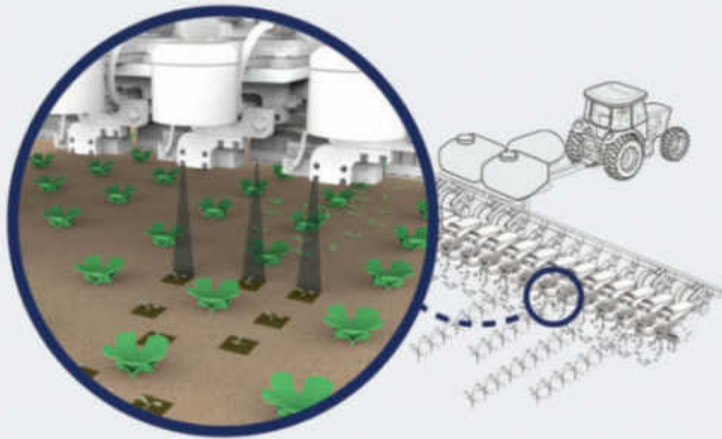
Farming marine fish inland will relieve pressure on the oceans

IN THE basement of a building on a wharf in Baltimore's inner harbour, a group of aquaculturists at the Institute of Marine and Environmental Technology is trying to create an artificial ecosystem. Yonathan Zohar and his colleagues hope to liberate the raising of ocean fish from the ocean itself so that fish farms can be built inland. Fresh fish, served the day it comes out of the brine (even if the brine in question is a judicious mixture of tap water and salts), would thus become accessible to millions of landlubbers who must now have their fish shipped in from afar, deep-frozen. Equally important, marine-fish farmers would no longer have to find suitable coastal sites for penning stock while it grows to marketable size, exposing the crowded animals to disease and polluting the marine environment.

People have raised freshwater fish in ponds since time immemorial, but farming species such as salmon that live mainly in salt-water dates back only a few decades, as does the parallel transformation of freshwater aquaculture to operate on an industrial scale. Now fish farming is booming. As the chart on the next page shows, human consumption of farmed fish has overtaken that of beef. Indeed, one way of supplying mankind with enough animal protein in future may be through aquaculture. To keep the boom going, though, technologists like Dr Zohar must become ever more inventive.

His ecosystem, which is about to undergo commercial trials, constantly recycles the same supply of brine, purified by three sets of bacteria. One set turns ammonia excreted by the fish into nitrate ions. A second converts these ions into nitrogen (a harmless gas that makes up 78% of the air) and water. A third, working on ►►

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▶ the solid waste filtered from the water, transforms it into methane, which—via a special generator—provides part of the power that keeps the whole operation running. The upshot is a closed system that can be set up anywhere, generates no pollution and can be kept disease-free. It is also escape-proof. That means old-world species such as sea bream and sea bass, which cannot now be grown in America because they might get out and breed in the wild, could be delivered fresh to the table anywhere.

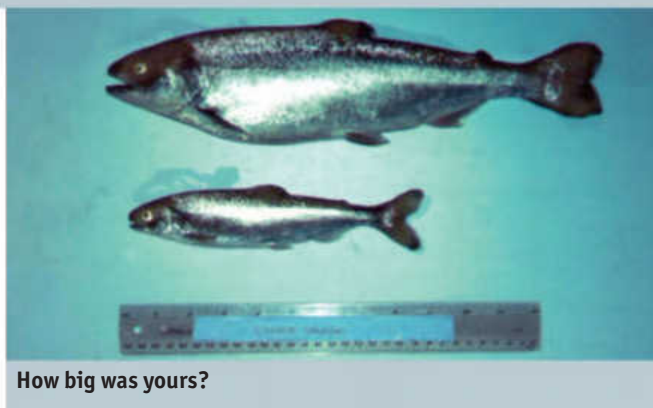
Besides transforming the design of fish farms, Dr Zohar is also working on extending the range of species that they can grow. He has spent decades studying the hormone system that triggers spawning and can now stimulate it on demand. He has also examined the needs of hatchling fry, often completely different from those of adult fish, that must be met if they are to thrive. At the moment he is trying to do this for one of the most desirable species of all, the bluefin tuna. If he succeeds, and thus provides an alternative to the plummeting wild populations of this animal, sushi lovers around the world will be for ever in his debt.

Gone fishin'

Fish farmers used to dream of fitting their charges with transgenes to make them grow more quickly. Indeed, over the past couple of decades researchers have treated more than 35 fish species in this way. They have often been spectacularly successful. Only one firm, though, has persisted to the point of regulatory approval. AquaBounty's transgenic Atlantic salmon, now cleared in both America and Canada, has the desirable property of rapid growth. Its transgene, taken from a chinook salmon, causes it to put on weight all year round, not just in spring and summer. That halves the time the fish will take to reach marketable size. Whether people will be willing to eat the result, though, is an experiment in its own right—one that all those other researchers, only too aware of widespread public rejection of transgenic crops, have been unwilling to conduct.

That may be wise. There is so much natural variation in wild fish that conventional selective breeding can make a big difference without any high-tech intervention. Back in 2007 a report by researchers at Akvaforsk, now part of the Norwegian Institute of Food, Fisheries and Aquaculture Research (NOFIMA), showed that three decades of selective breeding by the country's salmon farmers had resulted in fish which grew twice as fast as their wild progenitors. Admittedly starting from a lower base, those farmers had done what AquaBounty has achieved, but without the aid of a transgene.

If conventional selection can yield such improvements, it is tempting not to bother with anything more complicated. Tempting, but wrong. For, as understanding of piscine DNA improves, the sort of genomic selection being applied to crops can also be



applied to fish.

Researchers at SalmoBreed of Bergen, in Norway, have employed it not to create bigger, faster-growing fish but to attack two of fish farming's banes—infestation and infection. By tracking SNPs (single-nucleotide polymorphisms, a variation of a single genetic letter in a genome used as a marker) they have produced varieties of salmon resistant to sea lice and also to pancreas disease, a viral illness. They are now looking into a third problem, amoebic gill disease. In Japan, similar work has led to the development of flounders resistant to viral lymphocystis, trout immune to “cold-water” disease, a bacterial infection, and amberjack that evade the attentions of a group of parasitic worms called the monogenea.

Altering nature, then, is crucial to the success of fish farming. But nurture can also give a helping hand, for example by optimising what is fed to the animals. As with any product, one key to success is to get costs down. And here, environmental and commercial considerations coincide.

A common complaint by green types is that fish farming does not relieve as much pressure on the oceans as it appears to, because a lot of the feed it uses is made of fish meal. That simply transfers fishing pressure from species eaten by people directly to those that get turned into such meal. But fish meal is expensive, so researchers are trying to reduce the amount being used by substituting plant matter, such as soya. In this they have been successful. According to a paper published last year by researchers at NOFIMA, 90% of salmon feed used in Norway in 1990 was fish meal. In 2013 the comparable figure was 30%. Indeed, a report published in 2014 by the European Parliament found that fish-meal consumption in aquaculture peaked in 2005.

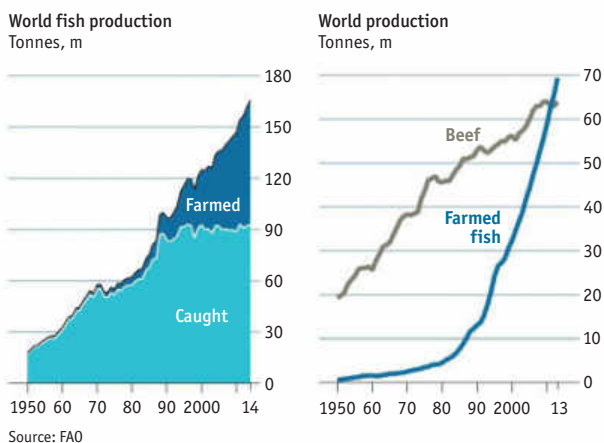
It's a gas

Feeding carnivores like salmon on plants is one way to reduce both costs and environmental harm. Another, which at first sight seems exotic, is to make fish food out of natural gas. This is the proposed business of Calysta, a Californian firm. Calysta feeds the gas—or, rather, its principal component, methane—to bacteria called methanotrophs. These metabolise the methane, extract energy from it and use the atoms thus liberated, along with oxygen from water and nitrogen from the air, to build their bodies. Calysta then turns these bodies into protein pellets that are sold as fish food, a process that puts no strain at all on either sea or field.

Even conventional fish foods, though, are low-strain compared with feed for farm animals. Because fish are cold-blooded, they do not have to eat to stay warm. They thus convert more of their food into body mass. For conservationists, and for those who worry whether there will be enough food in future to feed the growing human population, that makes fish a particularly attractive form of animal protein.

Nevertheless, demand for the legged and winged sort is growing too. Novel technologies are therefore being applied to animal husbandry as well. And some imaginative researchers are even trying to grow meat and other animal products in factories, cutting the animals out of the loop altogether. ■

A fishy on a little dishy



Animal husbandry

Stock answers

Technology can improve not only productivity but animal welfare too

IF THE future of farming is to be more factory-like, some might argue that the treatment of stock animals such as chickens and pigs has led the way. Those are not, though, happy precedents. Crop plants, un sentient as they are, cause no welfare qualms in those who worry about other aspects of modern farming. Even fish, as long as they are kept healthy, rarely raise the ire of protesters. Birds and mammals are different. There are moral limits to how they can be treated. They are also individually valuable in a way that crop plants and fish are not. For both these reasons, they are worth monitoring one at a time.

Cattle, in particular, are getting their own private sensors. Devices that sit inside an animal's rumen, measuring stomach acidity and looking for digestive problems, have been available for several years. They have now been joined by movement detectors such as that developed by Smartbell, a small firm in Cambridge, England. This sensor hangs around a cow's neck, recording its wearer's movement and transmitting that information to the cloud. An animal's general activity level is a good indication of its fitness, so the system can give early warning of any trouble. In particular, it immediately shows when its wearer is going lame—a problem that about a fifth of British cattle suffer at some point in their lives. If picked up early, lameness is easily treated. If permitted to linger, it often means the animal has to be destroyed.

Movement detectors can also show if a cow is ready for insemination. When she is in oestrus, her pattern of movement changes, and the detector will pick this up and alert her owner. Good breeding is crucial to animal husbandry, and marker-assisted genomic selection will ensure that the semen used for such insemination continues to yield better and better offspring. What is less clear—and is actively debated—is whether genome editing has a role to play here. Transgenics has given an even wider berth to terrestrial animals than it has to fish, and for the same reason: wary consumers. Some people hope, though, that this wariness will not apply to animals whose DNA has merely been tweaked, rather than imported from another species, especially if the edits in question will improve animal welfare as well as farmers' profits.

Following this line of thinking, Recombinetics, a firm in St Paul, Minnesota, is trying to use genome editing of the sort now being employed on crops to create a strain of hornless Holstein cattle. Holsteins are a popular breed for milking, but their horns make them dangerous to work with, so they are normally dehorned as calves, which is messy, and painful for the animal. Scott Fahrenkrug, Recombinetics' founder, therefore had the idea of introducing into Holsteins a DNA sequence that makes certain beef cattle hornless. This involved deleting a sequence of ten nucleotides and replacing it with 212 others.

Bruce Whitelaw at the Roslin Institute, in Scotland, has similarly edited resistance to African swine fever into pigs, by altering a gene that helps regulate immune responses to this illness to make it resemble the version found in warthogs. These wild African pigs have co-evolved with the virus and are thus less susceptible to it than are non-African domesticated animals. Randall Prather at the University of Missouri has similarly created pigs that cannot catch porcine reproductive and respiratory syndrome, an illness that costs American farmers alone more than \$600m a year. And at the International Livestock Research Institute in Nairobi, Steve

Kemp and his colleagues are considering editing resistance to sleeping sickness, a huge killer of livestock, into African cattle. All this would make the animals healthier and hence happier as well.

Not all such work is welfare-oriented, though. Dr Fahrenkrug has also been working on a famous mutation that increases muscle mass. This mutation, in the gene for a protein called myostatin, is found naturally in Belgian Blue cattle. Myostatin inhibits the development of muscle cells. The Belgian-Blue mutation disrupts myostatin's structure, and thus function. Hence the animals' oversized muscles. Two years ago, in collaboration with researchers at Texas A&M University, Dr Fahrenkrug edited the myostatin gene of a member of another breed of cattle to do likewise.

Where's the beef?

There may, though, be an even better way to grow muscle, the animal tissue most wanted by consumers, than on animals themselves. At least two groups of researchers think it can be manufactured directly. In 2013 Mark Post of Maastricht University, in the Netherlands, unveiled the first hamburger made from muscle cells grown in laboratory cultures. In February this year a Californian firm called Memphis Meats followed suit with the first meatball.

Dr Post's original hamburger, which weighed 140 grams, was assembled from strips of muscle cells grown in Petri dishes. Including all the set-up costs, it was said to have cost €250,000 (\$350,000), or \$2.5m a kilogram. Scaling up the process will bring that figure down a lot. This means growing the cells in reactor vessels filled with nutrient broth. But, because such cells are supposed to be parts of bodies, they cannot simply float around in the broth in the way that, for example, yeast cells used in biotechnology can. To thrive, they must be attached to something, so the idea is to grow them on small spheres floating in the vessels. Fat cells, which add juiciness to meat, would be cultured separately.

Do this successfully, Dr Post reckons, and the cost would fall to \$65 a kilogram. Add in technological improvements already under way, and he hopes that Mosa Meat, the firm he has founded to exploit his work commercially, will have hamburger mince ready for sale (albeit at the pricey end of the market) in five years' time.

Meanwhile researchers at Clara Foods, in San Francisco, are developing synthetic egg white, using transgenic yeast to secrete the required proteins. Indeed, they hope to improve on natural egg white by tweaking the protein mix to make it easier to whip into meringues, for example. They also hope their synthetic white will be acceptable to people who do not currently eat eggs, including vegans and some vegetarians. ■



The \$350,000 hamburger



Towards 2050

Vorsprung durch Technik

Technology will transform farmers' lives in both the rich and the poor world

ONE of the greatest unsung triumphs of human progress is that most people are no longer working on the land. That is not to demean farming. Rather, it is to praise the monumental productivity growth in the industry, achieved almost entirely by the application of technology in the form of farm machinery, fertilisers and other agrochemicals, along with scientifically improved crops and livestock. In 1900 around 41% of America's labour force worked on a farm; now the proportion is below 2%. The effect is less marked in poorer countries, but the direction of travel is the same. The share of city-dwellers in the world's total population reached 50% in 2007 and is still rising relentlessly, yet the shrinking proportion of people living in the countryside is still able to feed the urban majority.

No crystal ball can predict whether that will continue, but on past form it seems perfectly plausible that by 2050 the planet will grow 70% more food than it did in 2009, as the Food and Agriculture Organisation (FAO) says it needs to. Even though some crops in some parts of the world have reached a productivity plateau, cereal production increased by 11% in the six years after the FAO made that prediction. The Malthusian fear that population growth will outstrip food supply, now 218 years old, has not yet come true.

Yet just as Thomas Malthus has his modern-day apologists, so does his mythical contemporary, Ned Ludd. Neo-Luddism is an ever-present threat that can certainly slow down the development of new technologies—as has indeed happened with transgenics. But while it is fine for the well-fed to be prissy about not eating food containing genetically modified ingredients, their fears have cast a shadow over the development of transgenic crops that might help those whose bellies are not so full. That is unconscionable. With luck, the new generation of genome-edited plants, and maybe even animals, will not provoke such a reaction.

Regardless of whether it does, though, some other trends seem near-certain to continue into the future. Precision agriculture will spread from its North American heartland to become routine in

Europe and those parts of South America, such as Brazil, where large arable farms predominate. And someone, perhaps in China, will work out how to apply to rice the sort of precision techniques now applied to soyabeans, maize and other crops.

The technological rationale for precision suggests farms should continue to consolidate, though in an industry in which sentiment and family continuity have always played a big part, this may not happen as fast as it otherwise would. Still, regardless of the speed at which they arrive, these large holdings will come more and more to resemble manufacturing operations, wringing every last ounce of efficiency out of land and machinery.

Such large-scale farms will probably continue to be served by large-scale corporations that provide seeds, stock, machines and management plans. But, in the case of

the management plans, there is an opening for new firms with better ideas to nip in and steal at least part of the market.

Other openings for entrepreneurs are available, too. Both inland fish farming and urban vertical farming—though niche operations compared with Midwestern soyabean cultivation or Scottish sea-loch salmon farms—are waves of the future in the service of gustatorially sophisticated urbanites. And in these businesses, the idea of farm as factory is brought to its logical conclusion.

It is in the poorer parts of the world, though, that the battle for full bellies will be won or lost; and in Africa, in particular, the scope for change is both enormous and unpredictable. Though the problems of African farming are by no means purely technological—better roads, better education and better governments would all help a great deal—technology nevertheless has a big part to play. Organisations such as the NextGen Cassava Project, which apply the latest breeding techniques to reduce the susceptibility of crops to disease and increase their yield and nutritional value, offer Africans an opportunity to leap into the future. Crops could similarly jump from 18th- to 21st-century levels of potential in a matter of years, even if converting that potential into productivity still requires the developments listed earlier.

Looking further into the future, the picture is hazier. Large-scale genetic engineering of the sort needed to create C4 rice, or nitrogen-fixing wheat, or enhanced photosynthetic pathways, will certainly cause qualms, and maybe not just among the neo-Luddites. And they may not be needed. It is a general technological truth that there are more ideas than applications, and perfectly decent ones fall by the wayside because others have got there first. But it is good to know that the big ideas are there, available to be drawn on in case other yield plateaus threaten the required rise in the food supply. It means that the people of 2050, whether they live in Los Angeles, Lucknow or Lusaka, will at least be able to face whatever other problems befall them on a full stomach. ■

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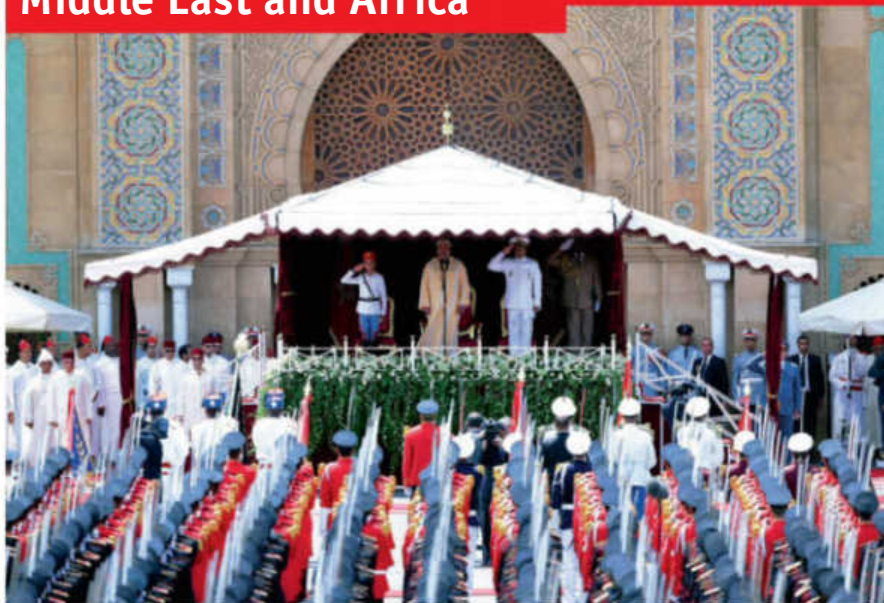
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Morocco

The pluses and minuses of monarchy

CASABLANCA

Morocco is doing well, but its king still needs to adapt

ON THE night of February 19th 2011, Abouamar Tafnout, an activist from Casablanca, suddenly grew nervous. He had just watched a documentary on the civil war in Algeria. We don't want that, he thought. Thousands of Moroccans were preparing to hit the streets the next day to challenge King Mohammed VI and the ruling elite, known to locals by the nickname *makhzen* ("the storehouse"), which controls much of the economy. Mr Tafnout, just 20 years old at the time, had helped to organise the protests. "I was afraid—afraid for the country," he says.

But most of Morocco's protesters, like Mr Tafnout, did not want a messy revolution. Rather, they pushed for a more constrained monarchy. When the king increased wages and pensions, and promised to relinquish some power, many were satisfied. A revision to the constitution, strengthening parliament, was passed by referendum in July 2011. Elections were held that November. Some blood was shed, but Morocco's version of the Arab spring went rather smoothly.

Five years on, Morocco is stable, relatively free and increasingly prosperous. Compare that with the rest of the region and it is little wonder that Moroccans are loth to upset the status quo. "Gradualism" is a popular word, even among those who would like to see their country become more like Spain, where the monarchy is largely ceremonial.

The king still dominates the state, but

he is popular. His granting of more rights to women and efforts to tackle poverty have gone down well. Critics say he is a cunning politician. Most Moroccans credit him for the country's stability. And he has capitalised on the calm by positioning Morocco as a hub for European manufacturers. Tax breaks and good logistics lure business. Car production, led by Renault, a big French producer, has more than doubled since 2011. The aeronautics industry has also taken off.

Renault's factory has a direct train line to the commercial port of Tanger-Med, 40km (25 miles) east of Tangier, which is expanding. By the time construction is completed, in 2018, it is expected to be the busiest port on the Mediterranean. Morocco is looking south, too. Casablanca Finance

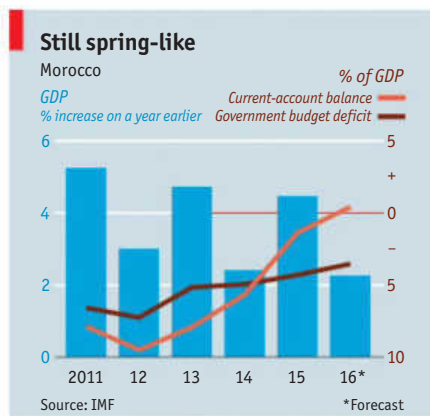
City, a public-private initiative, helps local and international firms that want to use the country as a base for their operations in Africa. It is building fancy new office space on the site of an old airport in the city.

As it upgrades its roads and infrastructure, Morocco is bound to experience catch-up growth—GDP grew 4.5% in 2015. But its government has also been clever. Tighter fiscal policy, including cuts to energy subsidies, has helped Morocco reduce its current-account and budget deficits. A drought may slow growth this year, but analysts are still bullish. "We think Morocco could record GDP growth of 5-6% over the next five to ten years," writes Jason Tuvey of Capital Economics, a consultancy.

But not everything is rosy. The monarchy can certainly get things done: big projects, such as the largest solar plant in the world and 1,500km of high-speed rail lines are moving ahead; but the average Moroccan must deal with a stifling bureaucracy. "The further you get away from the king, the harder things become," says Merouan Mekouar of York University in Canada. Members of the royal court use their proximity to advance their own projects and win contracts. Morocco ranks a woeful 88th in the world in Transparency International's corruption perceptions index.

The problem is compounded by a lack of accountability. Take the high-speed rail lines, which should more than halve travel time between Morocco's big cities. Some have questioned whether the billions of dollars might be better used to help the poor, given that Morocco is in the bottom third of the UN's human development index. Others wonder if a slowdown in global maritime trade makes the Tanger-Med expansion unwise, or ask why an initiative to boost tourism, Plan Azur, has failed to produce many results. No one in the royal palace seems to be checking.

Don't expect parliament to provide an- ▶▶



swers, either. Although the revised constitution gives the government more power over policy and appointments, the king is still firmly in charge. Moreover, “the regime has largely succeeded in taming opposition forces,” says Mohamed Daadaoui of Oklahoma City University. It has co-opted the Justice and Development Party (PJD), a mildly Islamist group that won the election in 2011. The PJD has not pushed for substantial democratic reforms. Yet it still faces a challenge from the Party of Authenticity and Modernity, which is even more supportive of the king, at parliamentary elections scheduled for October.

Journalists and activists criticise the monarchy, which puts them at risk. News outlets have been forced to close and journalists jailed in recent years. Reporters Without Borders, a pressure group, considers Morocco less free even than Algeria or Afghanistan. Consider the case of Ali Anouzla, a critic of the king, who has been accused of “inciting” terrorism. His alleged crime was to link to a video by al-Qaeda in the Islamic Maghreb, which he criticised.

In general, freedom of expression is curtailed by three red lines. Critical discussion of Islam, the monarchy or the disputed territory of Western Sahara is banned. Even so, protests are common in Morocco, over such things as employment and pay. But they are often broken up by police, who tend to use heavy-handed tactics. When protesters questioned the enormous royal budget in 2012 they were beaten.

Many Moroccans are ill-equipped to question their king. Almost a third of the population is illiterate. Others protest in a different way. About 1,500 Moroccans are thought to have joined Islamic State (IS) in Iraq and Syria. Hundreds more are training in Libya, leading to fears that they may return to launch attacks in Morocco. Youth in rural areas, where poverty is widespread, are seen as particularly vulnerable to the terrorists’ message. So the king—who also holds the title, “commander of the faithful”—has created a new religious training institute in Rabat, the capital, to promote his moderate brand of Islam.

The threat of terrorism has also been used as an excuse to silence critics, while the turbulence of the region is cited to dim the ardour of reformists. But by comparing itself with the Arab world, Morocco is setting a low bar. Many of its citizens speak French and Spanish, and would rather look to Europe for inspiration.

The king has encouraged such thoughts on economic matters. But he is thwarting Morocco’s political progress. Little effort has been put into building the institutions, like an independent judiciary, that would be needed in a constitutional monarchy. Still, Moroccans are hopeful. “Sometime in the near future, Morocco will be a democratic state,” says Mr Tafnout. “The monarchy is smart enough to know that.” ■

Public spaces in the Middle East

No bed of roses

BEIRUT

Parks are disappearing throughout the Arab world

“THE city has adorned herself with flowers of sweet scented herbs,” waxed the great Arab traveller, Ibn Jubayr, when he visited 12th-century Damascus. “It is encircled by gardens as the moon by its halo.” Later European travellers were no less entranced by the dazzling turquoise square—Naqsh e-Jahan, “the image of the world”—that Abbas I built in Isfahan in the 17th century, leaving behind accounts of its

splendours as well as of a host of other such leafy delights as drinking excursions on the banks of the Barrada River that flows through Syria’s capital. The Prophet Muhammad is even said to have shied from entering Damascus, otherwise called al-Fayha, “the fragrant”, for fear of entering Paradise twice.

He would have no need for hesitation today. Amid the bloodshed, car fumes and ▶▶

Ramadan in Saudi Arabia

Taking it to heart

RIYADH

The kingdom treats the holy month more seriously than anywhere else

RIYADH, the drab Saudi capital, looks uncharacteristically festive. The endless sprawl of ugly concrete buildings with light-reflecting glass is decked out in fairy lights and brightly coloured material. This is, after all, Ramadan in the country where the strictest form of Sunni Islam prevails.

But the Islamic month for fasting, reflection and celebration is also far more austere here than anywhere else. In most places going without food and drink from sunrise to sunset is a matter of personal conscience, and no laws enforce its observance. Not so in Saudi Arabia, where the Koran is considered a constitutional document.

Restaurants and cafés are forced to shut their doors until *iftar*, the daily breaking of the fast at sunset. The lobby of Al Faisaliah, a posh hotel in Riyadh, is usually bustling with meetings over coffee; now it is deathly quiet. Anyone

caught drinking or eating in public is punished; foreigners lose their jobs and are deported.

Most Saudis are religious, and appear to revel in the holy month. “It’s not hard to fast because I love Ramadan,” says a female bank clerk. “Fasting is easy—and good for you,” says an economist, although he adds that he drinks water on the sly during the day.

Foreigners, who are about a third of the country’s population of 30m, must find ways to cope in the 40°C heat. Many aren’t Muslim. Unlike Saudi citizens, many work on sweaty building sites, so going without water is a bit of a problem. They eat at home or sneak water and food during trips to the bathroom. Some hotels discreetly put on room service for “non-Muslim guests”.

Come *iftar* time Saudi Arabia cheers up. Lavish buffets abound; people lounge about long into the night. This is the time for family and friends, food and television—and often, the pious grumble, for overindulgence.

Other countries in the region are more relaxed. Lebanon, with its large Christian population, continues more or less as normal during the holy month. No one frowns on non-Muslims (or indeed non-fasting Muslims) taking refreshment in public. In Egypt, restaurants are open during the day, but quieter than usual.

Some Muslims prefer the Saudi approach to Ramadan. This year Dar al-Ifta, an Egyptian government body, suggested that fasting should be compulsory. Few who have experienced a Saudi Ramadan would agree.





How things used to be

▶ noise, residents are hard-placed to find anything fragrant in the sprawling cities of the Arab world. The number of places where people can mingle, picnic on cool watermelon by the rivers and fly kites has shrunk while their populations have soared. Per person, the amount of land devoted to parks, squares and other public spaces in Riyadh, for instance, has fallen by 80% in half a century. Public spaces now comprise just 2% of the area of Middle Eastern cities compared with 12% in the average European city, according to UN Habitat, an agency that monitors urban development in part through satellite imagery. They make up just 0.5% of Beirut.

“Historically parks were places for poetry, debates and tales of debauchery on the edge of the city, but the cities swallowed them as they grew,” says Nasser Rabbat, an expert on Islamic architecture at the Massachusetts Institute of Technology, who co-wrote a new book on Islamic gardens.

Greed is partly to blame, says Jala Makhzoumi, an Iraqi urban planner who has drafted plans for re-greening capitals across the Arab world. Unaccountable tycoons find ways to turn public spaces private. Local governments are often unwilling or unable to stop them. Developers, for instance, have recently fenced off one of Beirut’s last stretches of natural waterfront to build more gated high-rises. Its prime beach is now earmarked for a luxury hotel. Warlords-cum-politicians have appropriated Baghdad’s finest palm groves, and carved its plush neighbourhoods into walled enclaves.

Carelessness is another culprit. Half of the Arab world’s modern cities are, in effect, unplanned, says Eduardo Moreno, the research director at UN Habitat. Palestinian refugees have turned much of Beirut’s largest green space, the once-forested Horsh Beirut, into a camp; Israel set fire to the rest in its invasion of 1982. Closed for decades, the Horsh reopened last year, but only on a Saturday, and only if you get a ticket from the local government in advance.

Nicer cities might attract more tourists—a huge boon for countries that need to diversify their economies as oil revenues plummet. But since the 2011 Arab spring, when the people took over squares to stage protests, security concerns have trumped any other. Egypt’s generals have ringed the roundabout in Cairo’s Tahrir Square with iron grating. Bahrain’s King Hamad has levelled the Pearl roundabout where his subjects protested, and turned it into a traffic junction. “The ruling class across the Arab world are very much aware of potential of public space for people to gather, share their grievances and ultimately protest,” says Mr Rabbat.

Municipal officials point to the plethora of private malls as safe, clean spaces where families can mix and consume. But the environment there is as regulated as the air-conditioning. Security guards in Riyadh prevent the entry of single men, and stand ready to evict anyone who might even consider causing a disturbance. “Urban values of civil participation are almost absent in the Arab urban context,” sighs Rami Nasrullah, a Palestinian city planner who researches Arab urban growth.

Some Arabs hope things will change. Over the past year, tens of thousands of people have repeatedly thronged to Baghdad’s Freedom Square, next to the Green Zone, the vast enclave where the government rules. The Aga Khan has turned a Cairo rubbish dump into the city’s largest park (though you need a ticket to enter). In an attempt to greenify a square in Gaza, one of the world’s most densely populated areas, for its rallies, the Palestinian Islamist movement, Hamas, dragged tons of turf through its tunnels under the border with Egypt. Environmentalists in Lebanon have, at least, stopped the construction of a highway through Ashrafiya, Beirut’s Maronite core. But when last summer they began to mass in the city’s Martyrs’ Square to protest at a pile-up of rubbish, riot police quickly dispersed them. For now, the Arabs’ best open place is cyberspace. ■

Trade in east Africa

Worth celebrating

Regional co-operation has been good for at least part of the continent

WHEN the first East African Community (EAC) collapsed in 1977, some in the Kenyan government celebrated with champagne. Since its resurrection in 2000, officials are more often found toasting its success. A regional club of six countries, the EAC is now the most integrated trading bloc on the continent. Its members agreed on a customs union in 2005, and a common market in 2010. The region is richer and more peaceful as a result, argues a new paper* from the International Growth Centre, a research organisation.

Many things boost trade, from growth to international deals. The researchers use some fancy modelling to pick out the effect of the EAC. They find that bilateral trade between member countries was a whopping 213% higher in 2011 than it would otherwise have been. Trade gains from other regional blocs in the continent are smaller: around 110% in the Southern African Development Community (SADC), and 80% in the Common Market for Eastern and Southern Africa (COMESA).

Those numbers for the EAC are all the more impressive because the available data stop before the EAC’s common market had properly come into effect. Progress on that front has sometimes stuttered. A 2014 “scorecard” identified 51 non-tariff barriers. Full implementation could double the income gains seen so far, say the researchers. Not surprisingly, it is landlocked Rwanda which would see the biggest benefits. Tanzania, which has dragged its feet on integration, would profit the least.

The researchers are warier of the EAC’s other grand project: creating a common currency by 2024. The impact on trade would be small, they say, and not worth the risks. A study last year by the IMF ▶▶



► found that east African economies move out of sync with each other, using exchange rates to absorb shocks. Greater convergence might make a common currency viable; without it, a single currency would mean that wages might have to do the work of adjustment, as Greece has become painfully aware. The euro crisis should give policymakers pause for thought.

Political convergence matters too. Recent squabbles over railways and an oil pipeline show the difficulty of coaxing headstrong leaders to cooperate. But interdependence has reduced the risk of war,

the researchers argue. Regional trade blocs make sense for Africa. National economies are small: at market exchange rates, the combined GDP of the EAC, home to 170m people, is less than New Zealand's. Regional groupings have more clout, and could one day form a continental free-trade area (a planned link-up between the EAC, COMESA and SADC is a start). Then the champagne corks would really start popping. ■

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 *'Regional Trade Agreements and the pacification of Eastern Africa', Thierry Mayer and Mathias Thoenig, International Growth Centre Working Paper, April 2016

The killing of albinos

Murder for profit

LILONGWE

A horrific trade in body parts fuels a spate of killings

“I AM desperate to save my child,” says Martha Phiri, looking at her nine-year-old daughter Esther. The child, who has albinism, scribbles away in a book, oblivious to her mother's concerns. People with the genetic disorder, which is characterised by an absence of pigment in the skin, hair and eyes, have long suffered from discrimination in Malawi, where superstition about the condition runs deep.

But in the past two years taunts have turned into deadly attacks. On May 23rd, 38-year-old Fletcher Masina became at least the 18th person with albinism to be murdered in Malawi since the end of 2014 (others have disappeared and probably been killed). The killings are barbaric. Bodies are abandoned with limbs cut off and organs ripped out. More than 60 related cases have been recorded. These range from murders to the theft of bones from the graves of people with albinism. Attacks are driven by the belief that albino body parts can be used in witchcraft to bring wealth and cure disease. The UN warns that Malawi's estimated 10,000 albinos face “extinction” if the killings continue.

A relatively peaceful country, Malawi has never seen such violence before. It is Malawi's neighbour Tanzania that had previously been associated with attacks on albinos. But the Tanzanian government has in recent years done something about it. It has arrested unlicensed traditional healers and imposed stiffer penalties on “albino hunters” and those who trade in body parts. Thanks to the crackdown and to a campaign by a Canadian charity to teach Tanzanians that their albino neighbours have no magic powers, attacks against Tanzanian albinos have fallen. The government has registered people with the condition, so that it can monitor and track them,

and has established safe houses for children at risk of attack.

The Malawian government suggests that foreign witchdoctors from Tanzania and elsewhere are behind the attacks on its soil. In Malawi people with albinism are not monitored, crimes go uninvestigated and penalties are mild. It is typically not the witchdoctors themselves who abduct and kill. More commonly, it is locals who are swayed by promises of large sums of money. In many cases relatives are involved. “Some parents or relatives don't really value a child with albinism. They get tempted by the offer of money,” says Bonface Massah, head of the Association of People with Albinism in Malawi.

As for the source of demand for albino body parts, speculation abounds. Dr Mary Shawa of the Ministry of Gender, Disability and Social Welfare in Malawi denies that there is a market and insists that the

murderers are opportunists acting on rumours of payments. But there is plenty of evidence to suggest that there is indeed an organised trade: many of those arrested in Malawi in possession of bones have said they were to be sold to buyers in neighbouring countries.

People with albinism, for their part, live in fear. Many do not go out at night and are wary about whom they meet. In January two women offered Ms Phiri 1m kwacha (\$1,450) for Esther so they could extract the gold they believed was in her bones. Esther now rarely leaves the house.

“I'm scared. What if I'm next?” says Clement Gweza, 24, a teacher living in a remote village in Dedza district, where two of the murders have taken place. “I can't live like I used to.”

In a new report Amnesty International, a human-rights group, says the Malawian government has failed to protect albinos. It criticises the government for, among other things, not trying hard to investigate why Malawi has seen a rise in attacks or to work out where demand is coming from. Peter Mutharika, Malawi's president, says he is “ashamed” by the attacks; but he seems to have done little about them.

Thanks to corruption, public funds do not go as far as they should. In 2013 the country's main donors—who provided more than a third of government spending—stopped writing cheques after they found that officials had been looting the treasury. Meanwhile incompetent police investigations and lenient sentences do very little to deter continued attacks. In 2015 a man was fined 20,000 kwacha, or \$29, for possessing human bones. Police assumed he had dug up a grave, rather than investigating a potential murder.

There has yet to be a murder conviction for any of the killings, most of which remain unsolved. “We are talking about 18 lives lost,” says Mr Massah. “That is tragic for a small country. How much longer must we wait for help?” ■



No magical powers



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Rome elects a mayor

Five-star surprise

ROME

Italy's populists are getting serious. That is bad news for Matteo Renzi

“THIS isn't populism,” said Alessandro Di Battista of the Five Star Movement (M5S) as the first-round results of Italy's local elections on June 5th came in. “It isn't a protest. It's good politics.” The M5S candidate for mayor of Rome, Virginia Raggi (pictured), had taken 35% of the votes. Mr Di Battista, one of the party's leaders, was relishing its biggest breakthrough since the general election of 2013, when it won a quarter of the ballot.

The race now moves to a run-off on June 19th. But with a ten-point lead in the first round over the candidate of the governing Democratic Party (PD), Ms Raggi is well placed to become Rome's first woman mayor. It was a good showing in M5S's first electoral test without its co-founders: Beppe Grillo, who has resumed his career as a comedian, and Gianroberto Casaleggio, an internet entrepreneur who died in April. Running the movement is now the job of a five-person directorate that includes Mr Di Battista.

The face of M5S that voters saw in these elections was a new one. The populist Mr Grillo and his amusing (and sometimes disquieting) rants, his mistrust of the euro and ambiguity on immigration, were all pushed to the sidelines. In his place were candidates like Chiara Appendino, a company executive and graduate of Milan's business-oriented Bocconi university. She

won through to the second round in Turin against a formidable rival: the PD's ex-leader, Piero Fassino.

In Rome Ms Raggi, a 37-year-old lawyer and consumer activist, projected a moderation that would reassure the most conventional of voters. But Mr Di Battista was wrong to claim her win was not a protest vote: the city is seething with discontent. Rome is plagued by overflowing rubbish bins, untended parks and gardens, inadequate public transport and roads dotted with potholes. City politicians from the mainstream parties are on trial along with organised criminals, accused of jointly skimming municipal contracts. Romans are not accustomed to being ashamed of their city. Yet for the past seven months it has been subject to the sort of direct, central-government administration normally reserved for Mafia-ridden villages in the rural Mezzogiorno. Ms Raggi's very lack of experience in office was an asset.

Elsewhere, M5S's results were anything but spectacular. In Milan, it got 10%; in Naples, less. If anything, the elections were a setback for the mainstream parties more than a victory for their maverick rival. The Italian right, made up of the strident, populist Northern League and Silvio Berlusconi's more moderate Forza Italia party, did well where they united to back one candidate: in Milan, the right finished less than a

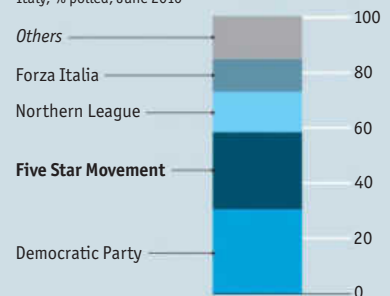
percentage point behind the PD. Wherever the parties ran separate candidates, however, they paid dearly for it. On election night Mr Berlusconi suffered a heart problem, which was blamed on the stress of the campaign; two days later he checked himself into a hospital for tests.

Mr Renzi, whose default mode is boundless optimism, admitted he was disappointed with the PD's results. The governing party's candidate failed to make the run-off in Naples, whose radical left mayor, a former magistrate, Luigi de Magistris, looks certain to be re-elected. The PD could yet lose Milan and possibly even Turin, one of its strongholds.

Most governments suffer mid-term setbacks, but this one is peculiarly ill-timed for Mr Renzi. He has introduced some valuable reforms, including an overhaul of Italy's labour laws. But his overriding aim has been to change Italy's constitution and its electoral law to give himself a second five-year term, undisturbed by party revolts, in which to impose a more comprehensive programme of change. His critics, includ- ▶▶

Narrow margin

If there were an election now, how would you vote?
Italy, % polled, June 2016



Source: EMG Acqua

ing some in his own party, see that as disturbingly akin to one-man rule.

The electoral law has already been altered in parliament. But the constitutional reform has to be approved by a referendum in the autumn. To win it, Mr Renzi needs momentum. And the local election results have broken his stride. They have also stripped him of a reputation for invincibility acquired at the European elections in 2014, when his party took more than 40% of the vote in a ballot that saw other centre-left parties routed.

Mr Renzi's explanation for the PD's poor showing, given after a meeting of the party leadership, focused entirely on politics and on himself personally, and not at all on whether his policies were working.

He had been giving too much attention to his government and not enough to his party, he said. That would now change. In particular, he said, he would "take a flame-thrower" to the PD in the south, where some activists have been shown to have unsavoury connections.

He did not attribute the PD's setbacks to anger at Italy's lethargic recovery from recession. On June 6th the Bank of Italy reduced its expectations for GDP growth this year to a modest 1.1%, the latest in a stream of downward revisions by forecasters. In April unemployment rose to 11.7%. Mr Renzi's chief response has been a barrage of optimistic rhetoric. His reaction to the local elections suggests he will stick with that approach. ■

said excluding Mr Benzema sent a poor message to kids in the *banlieues*, or outer-city estates, who have "none of our representatives (ie, players of Arab descent) on the French team". In fact one player, Adil Rami, has Moroccan parents.

Support poured in, however, for Mr Deschamps, a popular manager and captain of the victorious 1998 team. He had originally suspended Mr Benzema due to a police investigation into the player's role in blackmailing a fellow player (over a video known as "*la sextape*"). The claims of racism were "nonsense", said Kingsley Coman, a young black player. A livid Guy Stéphan, Mr Deschamps's deputy, conceded that France had "problems with integration", but said the football team could not take on responsibility for all such ills. Mr Debboze apologised. Even Manuel Valls, the prime minister, got involved, declaring that "players are not selected according to their skin colour or origin".

"Football in France has the power to unite, but also reflects social tensions," says Darren Tulett, a football presenter in France. Although big tournaments inspire national passion, and victory would improve the national mood, the Paris elite tends to prefer rugby to football. Some French clubs reflect the country's industrial working-class history. Sochaux, for example, in eastern France, was founded in the 1920s by the Peugeot family to provide sport for the carmaker's workers.

But football's great base of support, and talent, is today found in the multi-racial *banlieues*, where many French-born youngsters of North African and African descent grow up playing for local after-school clubs. Young players can be propelled rapidly into a world of fabulous riches, embodied today by the Qatari-owned club, Paris Saint-Germain. This inspires some jealousy and antipathy towards the players in certain parts of society, says Pascal Boniface, director of the Institute of International and Strategic Relations and a writer on football.

While the French prepare to fall back in love with their national team, which their bookmakers have as favourite to win, more immediate worries concern security. The memory of the November attacks in Paris, which killed 130 people, has not yet faded. (Those attacks began with a bombing at the Stade de France; sports events are easy targets for terrorists.) The country remains under a state of emergency for the duration of the tournament. The government has put 90,000 police, gendarmes and security agents on the streets. Just days before the opening match, Bernard Cazeneuve, the interior minister, unveiled a smartphone app that can alert people in case of a terrorist attack. France, in short, is steeling itself for the best, and the worst. As Mr Cazeneuve put it: "100% precaution does not mean 0% risk." ■



European football championships

Paris match

PARIS

Amidst racial tension and terror warnings, France hosts a tournament

ALMOST all French aspirations, and anxieties, seem to crowd into the game of football. Ever since the country won the world cup in 1998, with a multi-racial team made up of *black, blanc, beur* ("black, white and Arab"), the French have yearned to recapture that moment of post-colonial conviviality and national euphoria. On June 10th, when Europe's biggest football tournament kicks off at the Stade de France outside Paris, the hosts once again hope to find unity as a nation through victory on the pitch. The tricolour flags are ready. Yet the French have an ambiguous relation-

ship with football, which has become a touchstone for wider unease about wealth, capitalism, foreigners and race.

The latest controversy was prompted by allegations of racism over the selection of the French tournament squad. Karim Benzema, a French striker of Algerian origin, charged that he was left out because of the manager, Didier Deschamps, bowed to racist pressure (a claim undercut by the fact that half of those who made the team are black). Eric Cantona, a former French player, made the same allegation. Jamel Debboze, a French actor of Moroccan origin,

Poland's anti-government rallies

From Facebook to the streets

WARSAW

A new mass movement is proving more effective than the official opposition

AT THE head of a march of thousands in Warsaw on June 4th, Mateusz Kijowski cut a striking figure. The red jeans, ponytail and earrings of the leader of a new Polish mass movement contrasted with the sober suits of the two former presidents who flanked him. Since December, when he founded it, the Committee for the Defence of Democracy (KOD) has turned the formerly obscure 47-year-old IT specialist into one of the most powerful figures in Polish politics. KOD is now in the vanguard of resistance to Poland's ruling Law and Justice party (PiS), filling a void left by a weak and divided political opposition.

KOD has brought large numbers of Poles onto the streets in nationwide demonstrations; exact figures are fiercely disputed. It has drawn international attention, piled pressure on the government and made Mr Kijowski reviled by PiS supporters. And it has become a conduit for anger at abuse of the rule of law. Since taking power last year, PiS has tried to reorganise Poland's constitutional court, seized direct control of the state broadcasting channels and the security services, and purged the bosses of state-owned companies. The European Union is reviewing whether its moves violate EU statutes. "We want to have a government that respects the law," says Mr Kijowski. "We are not fighting against the result of the election, we are fighting

against a government that breaks the constitution."

KOD was born when Mr Kijowski shared an article on Facebook by Krzysztof Lozinski, a journalist, calling for a new political movement to fight the government. The enormous response prompted him to form a group, never dreaming that it would move offline and grow into a mass movement.

"I thought we might get 50 to 100 people when we started," he says. KOD now has around 230,000 Facebook followers, and the number continues to rise. A survey by TNS, a pollster, found that 1.5m Poles, about 5% of the population, have taken part in KOD events, and that 40% approve of its actions. Before founding KOD, Mr Kijowski says, he had attended only two political-party meetings. As a blogger and activist he had focused on non-partisan issues such as fathers' rights and combating rape.

KOD's success has made Mr Kijowski a target. When it emerged that he had fallen behind on alimony payments to his first wife, critics argued he was unfit to take the moral high ground. Some government sympathisers claim KOD must have received support and funding from unnamed outside sources in order to grow so fast. (They have, however, provided no evidence.) Other criticism has come from his own side. Earlier this year a senior member of KOD quit, saying Mr Kijowski ran it autocratically, at odds with its stated ideals, and had treated her "like a slave".

The attacks have made life difficult at times, Mr Kijowski concedes. Yet so far he has managed to defy those who thought KOD would run out of steam. Many Poles are genuinely infuriated by the government's actions. And the organisation's name recalls an earlier era when the people defied their rulers: KOR was the Polish acronym for the Workers' Defence Committee, Poland's first big anti-communist group, established in 1976.

But Mr Kijowski has also played a shrewd political game. He has helped broker a loose coalition between opposition parties which has put its weight behind KOD. The renunciation of plans to turn KOD into a party has helped to defray suspicions that its founder aspires to power. Its goals, says Mr Kijowski, lie beyond its dispute with the government: "Our job is to create and support civic society, and this is a job that will never finish."



Kijowski: much Liked



Iran's Turkish connection

Golden squeal

ISTANBUL

Did officials help evade sanctions?

EARLIER this year, FBI agents detained Reza Zarrab (pictured), a Turkish gold trader, at Miami's international airport. His lawyer said he was on a family trip to Disney World. Turkey's president, Recep Tayyip Erdogan, batted away questions about the arrest. "This issue is of no concern to our country," he said.

It now appears otherwise. The investigation into Mr Zarrab, who is accused of using his gold business to help Iran's government skirt American sanctions, has dredged up embarrassing details about the young businessman's relationship with senior Turkish officials. In their bid to stop the court accepting Mr Zarrab's offer of a \$50m bail package, American prosecutors alleged that he had paid three Turkish ministers and the head of Halkbank, a state lender, tens of millions of dollars in bribes to keep his business running and hobble competitors. They also pointed to more than \$4.5m in donations by Mr Zarrab to a charity founded by Mr Erdogan's wife. "If the defendant were able to reach Turkish soil, he could cause the highest levels of Turkish government to block his return to the United States," they concluded.

Similar allegations against Mr Zarrab and others, including the cabinet ministers named in the court document, surfaced during a sweeping corruption investigation that rocked Mr Erdogan's government in 2013. After the Turkish president (then the prime minister) called the investigation a coup attempt, the charges against Mr Zarrab and the others were dropped. Many ►►

of the prosecutors and police officers involved were reassigned or themselves arrested, on conspiracy and terror charges. In 2015 Turkish officials presented Mr Zarrab with a “top exporter” award.

After combing through Mr Zarrab’s e-mail account and smartphone, American investigators say they have found evidence that supports the claims made during the 2013 probe. They may end up with much more if Mr Zarrab, who faces up to 75 years behind bars, cracks and agrees to a plea bargain.

The investigation has already sent Turkish stocks tumbling. Shares in Halkbank have fallen by 20% since Mr Zarrab’s arrest. But it is unlikely to put much of a dent in Mr Erdogan’s reputation at home. He emerged almost unscathed from the 2013 scandal. Many of his voters felt corruption was a small price to pay for a government that delivered prosperity. “The original investigation had limited impact,” says Naz Masraff of Eurasia Group, a consultancy. “This one would have even less.”

Abroad, however, the case may turn into a major headache. If found to have flouted American sanctions, Turkish banks may be barred from doing international business, says Atilla Yesilada of Global Source Partners, a firm of analysts. “Anything that implicates them would blow up like dynamite.”

And if the American lawyer in charge of the case, Preet Bharara, delivers strong evidence that senior Turkish officials took kickbacks from Mr Zarrab to help Iran evade sanctions, American courts would be able to try them. As the investigation proceeds, Mr Zarrab’s suspected accomplices might want to give Disney World a wide berth. ■

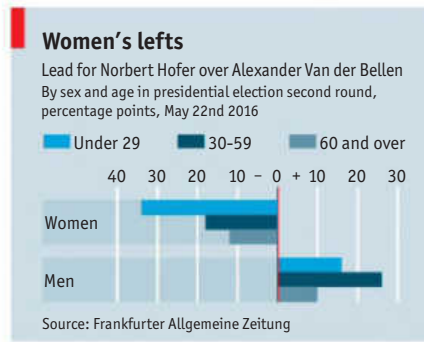
How men and women vote

The lefter sex

Europe’s far right is not such a hit with the ladies

IF WOMEN’S votes had not counted (as was the case until 1918), Norbert Hofer, the far-right candidate, would have won a landslide victory in Austria’s presidential election on May 22nd. According to exit polls, 60% of men supported him. But female voters favoured the Green Party candidate, Alexander Van der Bellen, by a similar margin. The ladies’ affections proved more valuable than the men’s: Mr Van der Bellen won by a sliver, 50.3% to 49.7%.

In many countries women are more likely than men to lean left, and the gap may be widening. In America, Barack Obama had a 12-point margin among fe-



male voters in 2012, but lost men to Mitt Romney by eight. This year 60% of women view Donald Trump unfavourably; only 48% feel that way about Hillary Clinton.

It was not always thus. In Europe, women were long seen as bastions of conservatism. In particular, Christian Democrat and Catholic parties benefited from the support of devout female voters. (Women are slightly more likely to be religious than men.) In 1968 the Christian Democrats won more than 50% of the female vote in Italy but less than 30% of the men. Research shows that in six European countries—Belgium, Britain, France, Italy, the Netherlands and West Germany—female voters skewed conservative in the early 1970s by between two and 14 percentage points.

This began to reverse in the 1980s and 1990s, according to a paper published in 2000 by Ronald Inglehart and Pippa Norris, two political scientists. In Austria, Ireland, Switzerland and most of Scandinavia, female voters moved to the left. This may have been the result of a decline in religious belief; the shift of women into the workforce, where they found themselves in low-paid jobs; and the rise of feminist issues such as abortion. Women were also less hawkish than men on defence, and more concerned about social equality and the environment.

European women have not swung all the way to the far left; they have mostly drifted to the centre. Mattia Forni of Ipsos Mori, a polling group, says that female voters tend to vote for reassuring politicians, rather than disruptive or insurgent leaders. In Italy the 2013 election saw the surge of the left-wing Five Star Movement, led by Beppe Grillo, a fiery and unpredictable eurosceptic comedian. He got more votes from men (29%) than from women (22%). By contrast, the more mainstream Matteo Renzi of the centre-left Democratic Party did somewhat better with the ladies.

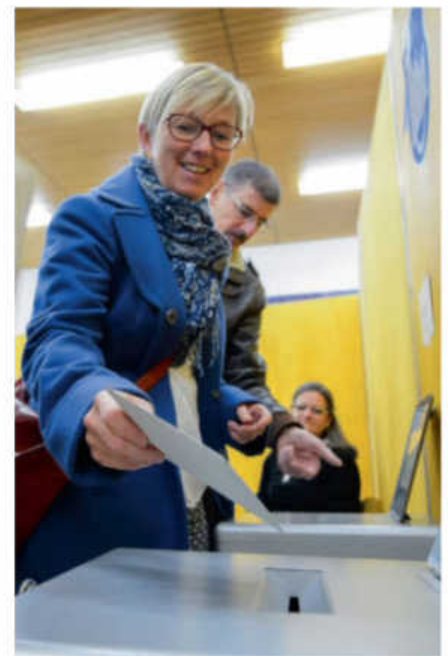
Women’s moderation shows up on the right, too. In a recent German opinion poll for Ipsos Mori, 35% of female voters favoured the centre-right Christian Democrat party of that model of motherly reassurance, Angela Merkel; male support was 31%. Only 12% of German women backed the far-right AfD party, against 16% of men.

An exception is France, where Marine Le Pen has closed most of the gap between the sexes’ willingness to vote for her far-right National Front. She has done so by cultivating a more mainstream image and shedding some of the party’s thuggish associations. When her irascible father, Jean-Marie, led the party, its vote was heavily male. But in 2012 Ms Le Pen scored almost as highly among women (17%) as among men (19%).

Women are not monolithic. The young and the old often differ: Austrian women under 29 favoured Mr Van der Bellen by more than 30 percentage points, while those aged over 60 preferred him by only ten. In the 2015 British election, the Labour Party enjoyed a plurality in every female age group under 55. In the 18-24 age range, women backed Labour over Conservatives by 44% to 24%. But women aged over 55 (a much bigger group) backed the Tories over Labour, by 45% to 27%. When the figures were aggregated, the Conservatives had a four-point lead among women and an eight-point lead among men.

Mr Inglehart and Ms Norris expect that in the long term women’s leftward political skew will only increase, as conservative older voters die and are replaced by more progressive young ones. But will it? Both men and women tend to become more conservative as they grow older. This could be for economic reasons: as people become richer they are more likely to resent high taxes. Or it could be for psychological or cultural reasons: as they age, people grow more set in their ways and resistant to social change.

But that is an issue for the long term. In the meantime, women may be Europe’s best defence against the far right. ■



Leans left, puts ballot in centre

Charlemagne | The politics of alienation

Even well-meaning parties based on ethnicity are a terrible idea



NO CITY in the Netherlands is so quintessentially Dutch as The Hague. The Binnenhof, the seat of government, is a quaint Gothic fortress straight out of a Brothers Grimm fairy tale. A mile to the west stands the beaux-arts Peace Palace, headquarters of the World Court; to the north is the glass-walled finance ministry, a temple of Calvinist fiscal transparency. But walk—or, rather, bicycle—just a mile eastwards, and a less traditional Netherlands comes into view, one of Ghanaian barber shops and Turkish tea houses. Women wear headscarves; men in djellabas duck into a storefront mosque for evening prayers.

Across from the mosque is Amin's Moroccan butcher's shop, where on a recent afternoon, behind a refrigerated counter full of shawarma, Jamal, the owner's 31-year-old son, was installing a computer. Jamal is just the sort of person who could bridge the gap between the country's traditional identity and its new immigrant communities. He came to the Netherlands with his family at age two, earned a business degree from Erasmus University, and worked in data analysis for several mid-sized companies. But last year he gave up on the corporate world and went back to his father's shop. In Dutch society "racial profiling is everywhere," he says; at his last company, he watched in dismay as white colleagues invented reasons to reject ethnic job applicants.

Like most Dutch with immigrant backgrounds, Jamal has in the past voted for the centre-left Labour Party. But now he is considering switching to Denk ("Think"), a new party that pitches itself explicitly to Muslims and ethnic minorities. After a decade of relentless insults from the anti-Muslim, anti-immigrant politician Geert Wilders (currently leading in the polls), many of his targets feel that neither Labour nor any other mainstream party is sticking up for them. Denk will not win more than a few seats in next year's general election, but it is posing a crucial question: at a time of rising xenophobia, can Europe's minorities rely on the broad centre-left parties for which they usually vote? Should they start their own parties? Or would that only make polarisation worse?

Throughout Europe, Muslims and non-whites tend to vote for the centre-left. In Austria 68% of ethnic-minority voters picked the Social Democrats in the recent general election, against 32% of whites. One study in France found that 93% of Muslims voted for the Socialist, François Hollande, in the 2012 presidential election.

But minorities often feel that centre-left parties take them for granted and offer little in return. The Muslims who turned out for Mr Hollande in 2012 stayed home during municipal elections in 2014. (Many blamed the Socialists' legalisation of gay marriage.) In France and elsewhere, when centre-left parties try to look tough on immigration or terrorism, minorities feel betrayed.

That was how Denk got its start. In 2014 the Netherlands' Labour deputy prime minister, Lodewijk Asscher, approved extra scrutiny of Turkish-Dutch civic groups to make sure they were not fomenting radical Islam. Soon after, Dutch media reported a poll claiming that 87% of young Turkish-Dutch sympathised with Islamic State. The poll was rubbish—a later study found interviewees had not understood the questions—but rather than dismiss the results, Mr Asscher called them "troubling".

Many Turkish-Dutch Labour stalwarts were infuriated. Party leaders seemed to know nothing about their constituency. "Anyone could see that poll was a mess," says Munire Manisa, a district council member in Amsterdam. Her solution was to meet Mr Asscher and, among other things, get him to commission the study which debunked the poll. But two ambitious Turkish-Dutch Labour MPs, Tunahan Kuzu and Selcuk Ozturk, seized the occasion to break with the party and form a new one.

Denk has now signed up candidates from the Netherlands' other two big minority groups: Moroccan-Dutch and Afro-Caribbean. In April it enlisted Farid Azarkan, a former top civil servant who heads the country's main Moroccan-Dutch civil-society group. Then in May it recruited Sylvania Simons, a Surinamese-born television host who has campaigned against the racially insensitive Dutch custom of Zwarte Piet, a black-faced figure who distributes cookies during the children's holiday of St Nicholas' Day. Ms Simons called for the "decolonisation" of education and language. Dutch traditionalists responded with floods of racist invective on Facebook, and Denk scored a publicity coup.

Denk charges that the condescension of parties like Labour towards Dutch minorities is leading to their growing alienation. "People don't feel recognised, and they don't feel safe," says Mr Azarkan. A long-running study of Amsterdam municipal elections shows that from the mid-1990s until 2006, when Mr Wilders's party appeared, Turkish-Dutch voter turnout was about 50%. By the 2014 elections it had fallen to 34%. Among Moroccan-Dutch voters it fell from 37% in 2006 to just 24% in 2014. "They don't feel represented by the Labour Party," says Floris Vermeulen of the University of Amsterdam, who co-heads the study, "but they have nowhere else to go."

Ethnic politicians need enemies, too

The danger, however, is that Denk's approach of representing only ethnic minorities will widen the divisions in Dutch society. "(The Denk MPs') speech is drenched with 'us-against-them' rhetoric," says Ahmed Marcouch, a Moroccan-Dutch Labour MP. When the Dutch parliament recently considered a resolution to recognise the Armenian genocide, Denk took the unusual step of forcing individual voting, so that they could use video of Turkish-Dutch MPs from other parties voting for the motion as campaign material with their constituents.

This sort of divisive politics seems inevitable if parties are ethnically defined. And that is perhaps why Jamal, in the end, will hesitate to vote for Denk. "The question is, does Denk think of itself as a party that's only for the immigrants?" he asks. "A political party is supposed to bring people together." ■



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Consequences of Brexit

Beyond the fringe

REYKJAVIK

Brexiters are deliberately vague about the alternatives to European Union membership. That is because most models, such as Iceland's, are unsatisfactory

AS THE referendum on June 23rd draws near, the campaign is becoming increasingly bitter. David Cameron has accused fellow Tories like Michael Gove, the justice secretary, and Boris Johnson, the former mayor of London, of “resorting to total untruths”. The Brexiters retort that the prime minister is panicking after polls put the Leave side narrowly ahead.

The economy is still the Leavers' weakest point. They are especially vulnerable to the charge of not setting out a preferred alternative trading relationship with the EU. Mr Gove has talked airily of a free-trade area from Iceland to Turkey, implying that a post-Brexit Britain would automatically be in it. Yet this is overly simplistic. The EU's single market is far deeper than a free-trade area, and most trade deals with the EU are incomplete and come with costs.

The Leave campaign's reticence may seem odd, as there are obvious examples of European countries outside the EU. Iceland, Liechtenstein and Norway are in the European Economic Area (EEA). This gives them access to the single market, although exports are subject to checks for rules of origin that Open Europe, a think-tank, says would, if applied to Britain, cost it almost 1% of GDP. Switzerland has two bilateral deals with the EU that achieve broadly the same result (though, crucially, they do not include most financial services). These four countries are richer and have lower

unemployment than the EU. If they can have the heaven of free trade without the hell of EU membership, why can't Britain?

Iceland may help offer an answer. The reason it has stood aside from the EU is fish, which still make up one-third of exports (though tourism has just overtaken it in its share of GDP). Icelanders know that the EU's common fisheries policy was a disaster, whereas they have managed their fish stocks well. Moreover, their highly protected farmers do not want European competition. The solution is the EEA, which excludes fisheries and farming but allows them to sell freely to the European market.

Even so, after its banking meltdown in 2008, Iceland applied to join the EU, because it needed financial stability. Many Icelanders wanted to dump the unreliable krona for the euro. But the euro crisis and a change of government scuppered the idea. Iceland is no longer formally a candidate. Lilja Alfredsdottir, the foreign minister, says the country has recovered from its financial crash and is now happy to remain in the EEA. Indeed, she argues that it has done better than euro-crisis countries because it was able to devalue and kept greater control over the policy response than, say, Greece or Ireland. By retaining precious sovereignty, she says, Iceland has the best of both worlds.

Yet many Icelanders disagree, and not just because it was really the IMF that dic-

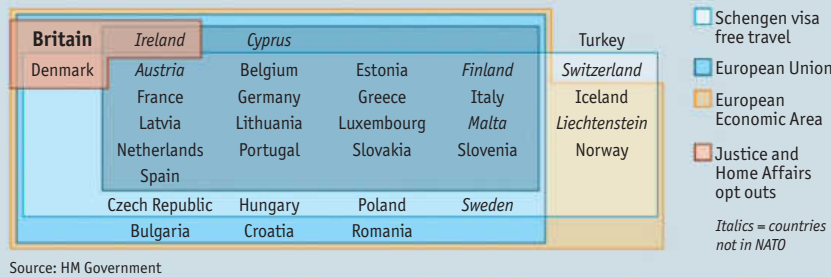
tated policy in 2008-09, as it did for the euro zone. Politicians like Benedikt Johannesson, who has just founded a new political party, are calling for a referendum on the resumption of EU membership talks. Critics highlight three other awkward facts about the EEA. First, its members (and Switzerland) are obliged to accept free movement of people—indeed, unlike Britain, all are in the Schengen passport-free travel zone (see table, next page). Second, all have to make large payments into the EU budget: in Norway's case, some 80-90% what Britain pays per head, in Iceland's only slightly less and in Switzerland's about half as much.

Third and most contentious, EEA members (and Switzerland) must observe almost all the EU's rules and regulations if they are to keep access to the single market. Norway implements almost 75% of EU legislation, despite having no say in any of it. A big Norwegian report in 2012 concluded mildly that “this raises democratic problems.” Baldur Thorhallsson, a political scientist at the University of Iceland, is more emphatic: he says EEA countries suffer a double democratic deficit, part arising from the EU's own failings, the rest from the fact that they are not even at the table to discuss legislative proposals.

Ms Lilja Alfredsdottir responds that a small country like Iceland would have little influence even if it were in the EU. But Olafur Stephensen of the Icelandic Federation of Trade says this is not the real point. What EEA countries lack, he says, is detailed knowledge of what is going on as well as contacts with the Brussels institutions and with other EU countries. This works to their disadvantage. Businesses in Iceland often criticise the government for its tardiness in implementing EU rules it has only just heard about, which can create ►►

Interlocking interlocutors

Relationship of European nations to European organisations



Source: HM Government

▶ problems for sellers into the single market.

What about the ability of EEA countries and Switzerland to strike trade deals with other countries? Brexiteers point to deals that Iceland and Switzerland (but not the EU) have managed to do with China. Yet these are shallow and one-sided. Switzerland has promised to cut tariffs on Chinese goods immediately, while China has promised to reciprocate only over the next 5-15 years. European countries outside the EU will also be excluded from the EU-Canada free-trade agreement, and from a putative Transatlantic Trade and Investment Partnership with America.

If these countries offer a poor model for Brexiteers, are others better? Turkey is in a customs union with the EU, but only for some goods, and not for services; it, too, falls outside EU trade deals with other countries. Balkan countries (Mr Gove has cited Albania) have association agreements that give access to the single market, but these are part of the process of accession, and they too exclude services. A Canadian-style free-trade deal is more promising as it includes free movement of labour, EU rules or payments into the EU budget. But it does not include all goods (car exports are subject to tariffs, for example), nor does it include financial services.

So Brexiteers may hope instead for a bespoke deal for Britain that gives access to the single market without EU rules, free movement of people or budget contributions. But this is a delusion. The EU cannot be generous to a post-Brexit Britain for fear that others (including the EEA) might demand the same. As evidence, consider what happened when the Swiss voted in early 2014 to restrict migration from the EU. The EU has refused even to discuss it: if the Swiss impose restrictions, they will lose access to the single market immediately.

Finally, some Brexiteers suggest giving up the single market and falling back on World Trade Organisation rules, and unilaterally abolishing tariffs. Yet as the WTO's director-general says, this is not a simple or cost-free option. It would mean tariffs on British exports to the EU, and no direct access for financial services. It would require Britain to renegotiate access to the 53 countries that have free-trade deals with the EU. And farmers, manufacturers and others would fight unilateral scrapping of tariffs, which would also mean a loss of leverage to open other markets.

It is hard not to conclude that, even if EU membership has unsatisfactory aspects, it beats all plausible alternatives. No wonder the markets are nervous about the result. ■

It may have chosen to opt out of the single currency, but it was more serious than others about security and foreign policy.

The 1997 Amsterdam treaty set up a system of “enhanced co-operation”, whereby a minimum number of countries (now fixed at nine of the 28) may adopt common policies so long as they remain open to new members and do not discriminate inside the single market. Yet in practice it has barely been used. A divorce reform and the European patent are rare examples. But the latest attempt by a group of euro-zone countries to agree to impose a financial transactions tax is close to collapse.

Britain has more opt-outs than any other country—from the Schengen passport-free zone, the euro and most EU policies in justice and home affairs (see table). Partly as a result, it has been hostile to anything that smacks of first- and second-class memberships. Its worry focuses on the single currency, a key subgroup of the wider EU. As more countries join (there are now 19 in the euro and only nine out), the British have resisted efforts to formalise this division, objecting to any plans to set up new euro-zone institutions or to give legal status to meetings of euro finance ministers or heads of government.

Yet the present government has also subtly shifted its position. As one former minister puts it, the old policy was to drive in the fast lane but as slowly as possible, holding everybody else back. Now the government is happy to pull over and let the others accelerate away, especially if that is deemed necessary to shore up the euro. This explains why, in his February renegotiation with the EU, David Cameron promised not to block future treaty changes that euro-zone countries might want to make for the single currency.

In exchange the prime minister won two concessions. The first is a formal recognition that the goal of ever closer union does not apply to every country. The second is a legally binding mechanism to allow nations that are not in the euro to challenge decisions by the euro group (which now makes up on its own a big enough majority to pass EU legislation) that they judge to be against their interests, if necessary by taking the issue to a full EU summit.

These concessions may seem esoteric, but Charles Grant of the Centre for European Reform, a think-tank in London, thinks they are important—and not just for Britain. What the EU has conceded is, in effect, that its members are now moving not just at different speeds but towards different ultimate destinations. This is why true believers in a federal Europe hated the deal given to Mr Cameron. But some other non-euro countries, like Sweden, Poland and Hungary, liked it. Indeed, if Brexit prevails on June 23rd, they may try to secure the same deal for themselves. In the EU, it seems, variable geometry is here to stay. ■

Brexit brief



The charms of variable geometry

Our final Brexit brief argues that a multispeed Europe suits Britain—and others

THE original idea of the European Union was that all members should move at the same speed towards the goal of “ever closer union”. But as the club expanded, it became clear that not everybody either wanted or would be able to proceed as quickly as their fellows. This led to a rash of plans to allow those who wanted to go faster not to be held back by the slowest.

The labels for these ideas have differed substantially. In 1994 two German Chris-

tian Democrats (one of them the present finance minister, Wolfgang Schäuble) suggested a “hard core” of the original six (minus Italy) that would integrate further and faster than the laggards. Jacques Chirac, France’s president, spoke of pioneer groups. Others floated the notion of a Europe of flexibility, concentric circles or moving at two speeds. Britain preferred to talk of variable geometry, to signify different groupings within the same broad club.

Bagehot | The new J-curve

Britain's flirtation with Brexit is more complicated than an anti-globalisation vote



RUSHDEN is deepest England. Mock-Tudor estates mingle with pubs and meadows. In the Windmill social club pro-Brexit activists gather and are joined by poker players and country-music buffs from the room next door. Bolts of lightning over the Northamptonshire hills light up the hall as Brexiteers slate the status quo. “You’re not living in a democracy any more, ladies and gentlemen!” burrs Derek Clark, a former member of the European Parliament for the UK Independence Party, ahead of a televised debate between Nigel Farage, UKIP leader, and David Cameron.

This is insurgent Britain: the segment of the country that mistrusts the power of Brussels and the IMF. One bank, an old buffer tells Bagehot, is at the heart of it all. “Mark Carney?” he says of the Bank of England governor: “Even he is Goldman Sachs.” Then he turns to the Bilderberg Group. This gathering of influential Western public figures, he insists, decided in 1953 to form the EU and has indoctrinated every British prime minister since.

Whipping a six-inch-thick wad of European Parliament committee papers from a suitcase and flinging the bag to the floor, Mr Clark laments how complicated it all is and decries the role of “so-called experts” in public life. Watching this scene, Bagehot cannot but ruminate on the much-cited observation that Western electorates are losing faith in globalisation. He is reminded of a quote by Antonio Gramsci, the Italian political theorist: “In this interregnum a great variety of morbid symptoms appear.” If Britain is living through a political transition, what is on the other side?

After all, for a place fed up with globalisation, Rushden seems to have benefited handsomely from the outside world. Cheap consumer goods fill its shops. Fancy technology is de rigueur in its new-build homes. Thanks to the local proliferation of financial-services and logistics firms (many of them providing back-office functions to big London companies), unemployment here in east Northamptonshire is only 3.4%. It is hard to see the insurgent sentiment in these parts as a product of deprivation.

In this sense Rushden is like the other Eurosceptic parts of Europe. Where right-wing populism—like the Brexit campaign—is gaining ground on the continent, it is often in the most developed, economically globalised regions. Places whose residents live a longer, more internationally interdependent and more materially wealthy life than almost anywhere else: Denmark, Sweden,

the Netherlands and provincial Germany. It is in such prosperous parts, rather than the truly struggling and unemployment-stricken ones like Greece and Spain, where the politics of national identity and right-populism are most obviously on the rise.

What is going on? In Rushden part of the explanation is that David Cameron, like mainstream leaders elsewhere, has played his hand badly in the past: too often pandering to populists rather than confronting them.

Yet that is insufficient. Two other ingredients are necessary for populist politics to thrive. First, a catalyst: nationalist Euroscepticism is an expression of fury at an establishment that, in straitened times, appears to do too much for spendthrift southern Europeans and migrants, and too little for local strivers. But second, it helps when the strivers in question have a cushion of economic security that is large enough for them to decide that national identity and sovereignty matter more than greater growth. The Leave campaign has acknowledged this. One of its recent posters reads: “It’s not just the economy, stupid.” “We need to value people’s quality of life and standards of living and not just national GDP figures,” argued Mr Farage in his debate with Mr Cameron, to loud cheers from the crowd in Rushden.

To be sure, the dissatisfaction is real. But it may be less revolutionary than it seems at first glance. When they gave examples of the evils of the union, speakers at the event in Northamptonshire cited damage to local roads caused by heavy European trucks, annoying regulations and new housing on the green belt. For all the anger (some even talked of civil unrest if the Leave campaign loses on June 23rd), these were not the complaints of a society that is on the brink.

Driven round the bend

Ian Bremmer of the Eurasia Group, a political consultancy, has talked of the “J-curve”. His point is that as countries open up they become more volatile before they become more stable. Perhaps Britain’s debate on Brexit reveals a second J-curve towards the top of the development path: where folk feel safe enough to challenge the globalised establishment but not rich enough to be part of it. Hence it is the lower-middle class of wealthy and sophisticated societies, rather than citizens of poorer ones, who seem to be the vanguard of populist politics. It is notable that in Britain, as in other northern European countries, this is storming ahead a few years after the economic crisis, once some growth has returned and unemployment has fallen. It takes a dab of security to rebel against the system.

But, as with developing countries on the J-curve, the country will one day emerge from its limbo. In Mr Bremmer’s scheme, growing openness powers countries through the bend. For this new J-curve it is growing economic and cultural confidence about globalisation among the majority. Increasing numbers of Britain’s young people are going to university. Its immigrant population is growing and integrating successfully. The prevailing conception of nationality is becoming more civic (a function of values, not background) and less nativist. With each generation, the world’s integration is becoming steadily less controversial.

Robert Ford of the University of Manchester claims that if the EU referendum were being held in ten or 20 years it would be much less close. Remain would win comfortably. In Gramsci’s terms: “The crisis consists precisely in the fact that the old is dying and the new cannot be born.” Like all such periods, this will pass. But in the meantime: watch out for those morbid symptoms.



Foreign aid

Misplaced charity

Aid is best spent in poor, well-governed countries. That isn't where it goes

NOT long ago Malawi was a donor darling. Being dirt poor and ravaged by AIDS, it was needy; with just 17m inhabitants, a dollop of aid might visibly improve it. Better still, it was more-or-less democratic and its leader, Joyce Banda, was welcome at Westminster and the White House. In 2012 Western countries showered \$1.17 billion on it, and foreign aid accounted for 28% of gross national income.

The following year corrupt officials, businessmen and politicians pinched at least \$30m from the Malawian treasury. A bureaucrat investigating the thefts was shot three times (he survived, somehow). Germany said it would help pay for an investigation; later, burglars raided the home of a German official and stole documents relating to the scandal. Malawi is no longer a donor darling. It now resembles a clingy lover, which would be dumped were it not so needy. It still gets a lot of foreign aid (\$930m in 2014), but donors try to keep the cash out of the government's hands.

Foreign aid can work wonders. It set South Korea and Taiwan on the path to riches, helped extinguish smallpox in the 1970s and has almost eliminated polio. Unfortunately, as Malawi shows, it is liable to be snaffled by crooks. Aid can also burden weak bureaucracies, distort markets, prop up dictators and help prolong civil wars. Taxpayers in rich countries dislike their cash being spent on Mercedes-Benzes. So donors strive to send the right sort of aid to

the places where it will do the most good. How are they doing?

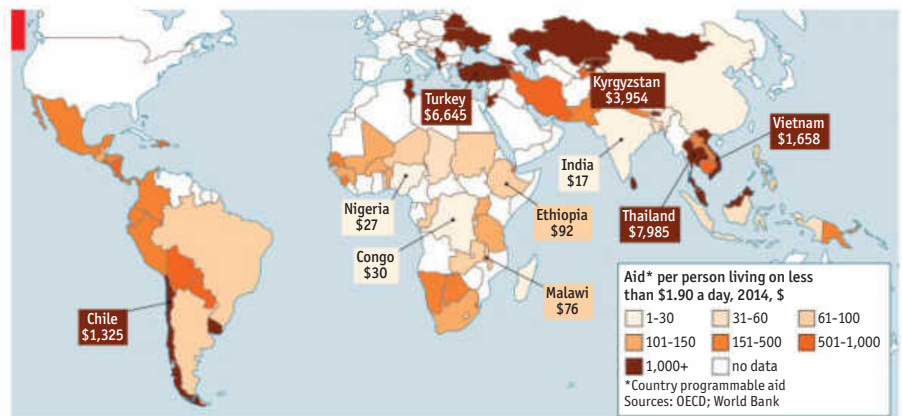
A decade ago governments rich and poor set out to define good aid. They declared that aid should be for improving the lot of poor people—and not, implicitly, for propping up friendly dictators or winning business for exporters. It should be co-ordinated; otherwise, says William Easterly of New York University, “the poor health minister is dealing with dozens of different donors and dozens of different forms to fill out.” It should be transparent. Where possible, it should flow through governments.

These are high-minded ideals, reflecting the time they were laid down: the cold war was over and the West had plenty of money. They are nonetheless sound. Aid-

watchers, who row bitterly over whether the world needs more foreign aid or less, mostly agree with them. They tend to add that aid should go to relatively free, well-governed countries.

By almost all of these measures, foreign aid is failing. It is as co-ordinated as a demolition derby. Much goes neither to poor people nor to well-run countries, and on some measures the targeting is getting worse. Donors try to reward decent regimes and punish bad ones, but their efforts are undermined by other countries and by their own impatience. It is extraordinary that so many clever, well-intentioned people have made such a mess.

Official development aid, which includes grants, loans, technical advice and debt forgiveness, is worth about \$130 billion a year. The channels originating in Berlin, London, Paris, Tokyo and Washington are deep and fast-flowing; others are rivulets, though the Nordic countries are generous for their size. More than two-fifths flows through multilateral outfits such as the World Bank, the UN and the Global Fund. Last year 9% was spent on refugees in donor countries, reflecting the surge of ►►



► migrants to Europe.

As the aid river twists and braids, it inundates some places and not others. India contains some 275m people living on less than \$1.90 a day. It got \$4.8 billion in “country programmable aid” (the most routine kind) in 2014, which is \$17 per poor person. Vietnam also got \$4.8 billion; but, because it is much smaller and rather better off, that works out to \$1,658 per poor person (see map on previous page). By this measure South-East Asia and South America fare especially well.

Western countries have mostly been shamed out of the cold war-era habit of funnelling aid to friendly regimes and former colonies. But aid is still used more-or-less explicitly as a tool of foreign policy—and increasingly so, says Owen Barder of the Centre for Global Development, a think-tank. Today’s enemy is not communism but radical Islam. Afghanistan, Egypt, Jordan, Syria and Turkey each got more net aid than Bangladesh in 2014, although none contains nearly as many poor people. This week the EU promised more aid to African and Middle Eastern countries that clamp down on migrants.

Rewarding failure

A better reason not to give much aid to the poorest countries is that many are badly run. But that is not why they get so little. Claudia Williamson of Mississippi State University has created a yardstick that measures both poverty and the quality of government. On her measure, the targeting of aid worsened between 2004 and 2012. “Aid goes to middle-income countries that are also poorly governed,” she says.

Donors often reward democratic reforms; they also try to punish corruption and backsliding, as in Malawi. Between 2009 and 2014, 12 countries improved by at least two points on a 14-point scale produced by Freedom House, a think-tank, suggesting they became notably more democratic and liberal. Ten of them received more net aid in 2014 than five years earlier. Of the nine aid-receiving countries that worsened by two points or more on the same scale, six got less.

But such inducements tend to be subtle, whereas the surge of aid into strategically important states is often huge. Net foreign aid to Turkey, an increasingly autocratic country that is not poor, rose more than tenfold between 2004 and 2014, to \$3.4 billion. Besides, donors often have short attention spans. Two academics, Darren Hawkins and Jay Goodliffe, have shown that donors tend to reward countries that are becoming more like them. Once countries have joined the democratic club, aid drops. American aid to Peru followed that pattern. “You get penalised for achieving too high a level of democratic governance,” says Brad Parks of AidData, another think-tank.

Even if Western countries sent clear, consistent signals, they might struggle to be heard. Aid has become less important to many poor countries than foreign investment or remittances. And donors have become far more diverse. Several countries that used to receive aid now hand it out; a few, including India and Turkey, do both. China distributed roughly \$3.4 billion last year, according to the OECD. Although that is puny next to America or Britain, China is important because it can act as a shock absorber, moving into a country when others are pulling out. Last month it promised Malawi more food aid and 100 police cars.

For corrupt dictators, Chinese aid is even better than the Western kind. China tends not to fuss over democracy, and it seldom objects to loans being spent on pointless grand projects: after all, it builds a lot of those at home. The money is easier to snaffle. One study found that Chinese aid is highly likely to flow to the districts where African leaders were born.

In one big way, though, the proliferation of donors harms poor countries. Aid now comes from ever more directions, in ever smaller packages: according to AidData, the average project was worth \$1.9m in 2013, down from \$5.3m in 2000. Mozambique has 27 substantial donors in the field of health alone, not counting most non-Western or private givers. Belgium, France, Italy, Japan and Sweden each supplied less than \$1m. Such fragmentation strains poor countries, both because of the endless report-writing and because civil servants are hired away to manage donors’ projects.

Donors would probably do more good

by concentrating on a few projects in a few countries. But they strive to achieve the opposite. To them, and to the politicians who control the purse strings, plastering the world with flags is a sign of success. Erik Solheim, chairman of the OECD’s Development Assistance Committee, remembers trying to persuade his own country, Norway, to focus on what it really knows about (managing an oil boom) rather than on things like tropical agriculture. He did not succeed.

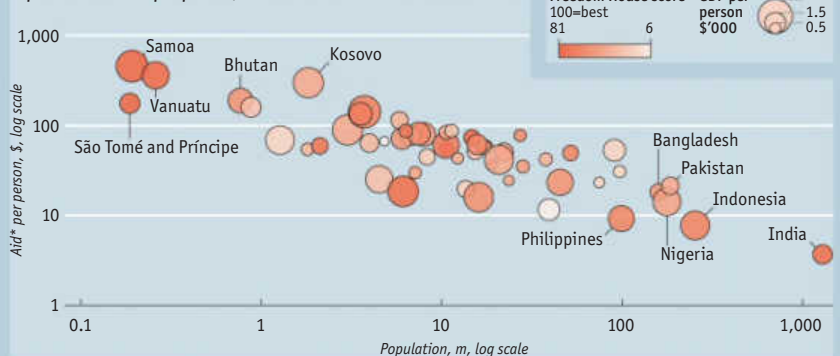
A decade ago the approved cure for fragmentation was for donors to pay aid directly to poor countries to use as they please. This has become deeply unfashionable. A donor who funds a government feels responsible for every dismal thing that government does, whether it is passing anti-gay laws or stealing the cash. Once lost, trust is hard to recover. Donors seem disinclined to resume direct budget support to Malawi: one describes it as “in the past”. Britain’s department for international development, which used to proselytise about the virtues of budget support, said last year that it would stop doing it. Increasingly, donors also earmark the funds they provide to multilateral outfits.

The situation is a mess in almost every way. Which is why it is good news that a great deal of progress has been made on one of the ideals agreed on in Paris a decade ago. Donors have become far more open about where their aid goes and how it is spent. It is because of the advances in transparency that we know just how badly things are going. But knowledge and the willingness to change are not the same. ■

Where does the aid go?

Why do donors lavish money on some countries and not others? Being well-governed (represented by the dark circles) seems to make no difference; nor, strangely, does being poor (the smallest circles). What helps is to be small. Among 56 low- and middle-income countries, the top ten aid recipients per person include seven of the ten least populous. The ten receiving the least aid include the six biggest. In 2014 Samoa received \$458 per person; India made do with \$3.69. Smaller countries tend to have less bureaucracy, so aid can be put to use more quickly. But the main reason is probably that a little cash can have a more visible effect in a small country. Jesus told his followers to do good secretly, and be rewarded in heaven. Some donors, it seems, cannot wait.

Population and aid per person, 2014



Sources: OECD; IMF; World Bank; Freedom House; *The Economist*

*Country programmable aid

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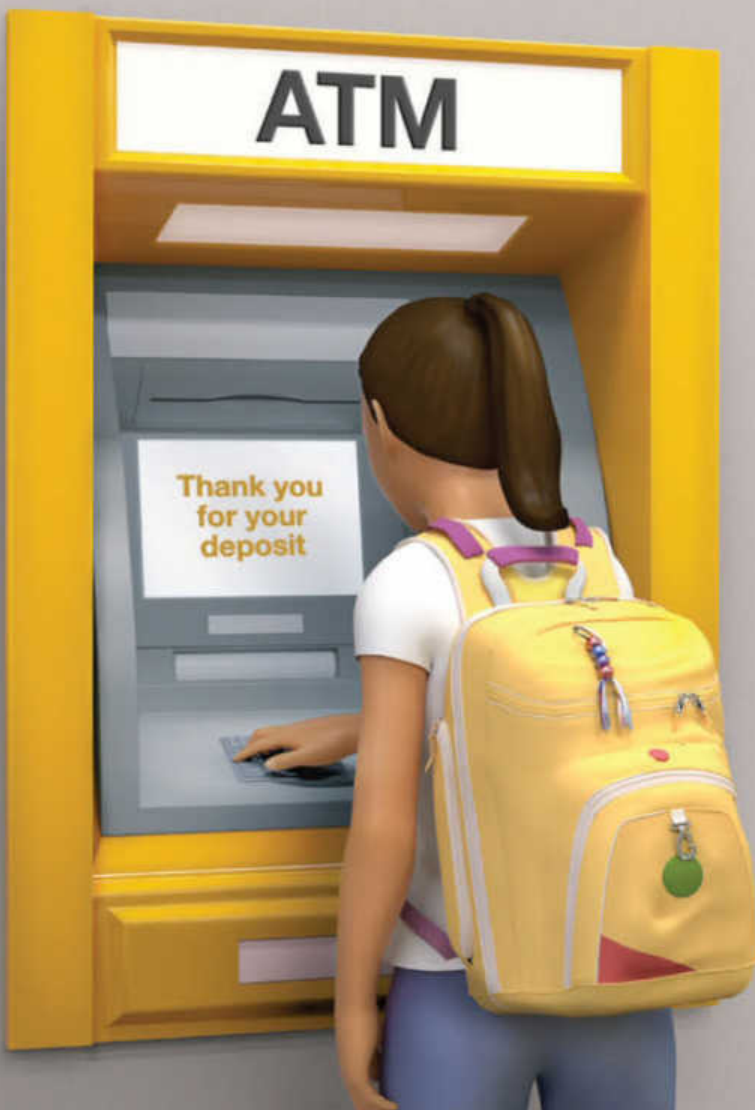
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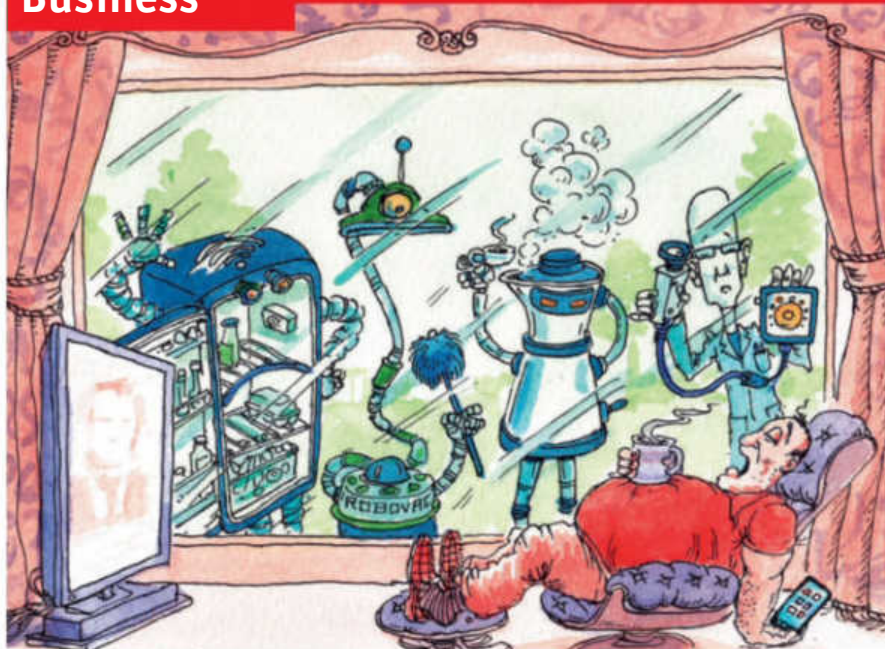
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The internet of things

Where the smart is

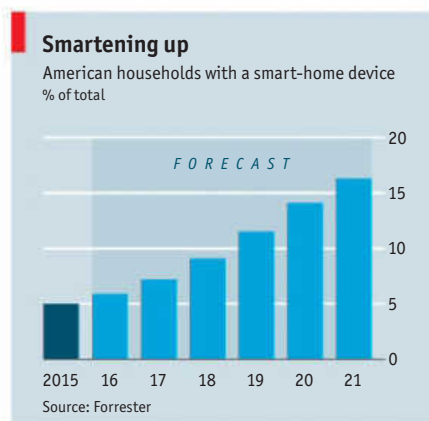
SAN FRANCISCO

Connected homes will take longer to materialise than expected

THE fanfare has gone on for years. Analysts have repeatedly predicted that the “internet of things”, which adds sensors and internet capability to everyday physical objects, could transform the lives of individuals as dramatically as the spread of the mobile internet. Providers have focused on the home, touting products such as coffee pots that turn on when the alarm clock rings, lighting and blinds that adjust to the time of day, and fridges that send an alert when the milk runs out. But so far consumers have been largely resistant to making their homes “smart”.

That’s not for want of trying by tech firms, which have poured cash into their efforts to connect everyday objects to the internet. In 2014 Google made the biggest statement of intent so far, spending \$3.2 billion to acquire Nest, a smart thermostat-maker, and \$550m to buy Dropcam, which makes home-security cameras. Nest absorbed Dropcam; it is now one of the best-known smart-home brands. But it is also a warning about how long it will take for such gadgets to enter the mainstream.

Nest has undoubtedly disappointed Google. It sold just 1.3m smart thermostats in 2015, and only 2.5m in total over the past few years, according to Strategy Analytics, a research firm. For a couple of years the firm has mainly tweaked existing products rather than introducing new ones. That may explain why Tony Fadell, Nest’s found-



der and boss, stepped down on June 3rd to take an advisory role at Google’s parent company, Alphabet (see next article). Mr Fadell, a former executive at Apple and designer of the iPod, failed to bring his magic touch to the smart home.

Nest’s problems are symptomatic. Only 6% of American households have a smart-home device, including internet-connected appliances, home-monitoring systems, speakers or lighting, according to Frank Gillett of Forrester, a research firm. Breakneck growth is not expected; by 2021 the number will be just over 15% (see chart). Too few consumers are convinced that the internet has a role to play in every corner of their lives. A survey conducted in Britain by Pri-

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cewaterhouseCoopers, a consulting firm, found that 72% of people have no plans to adopt smart-home technology in the next two to five years and that they are unwilling to pay for it. Last year consumers globally spent around \$60 billion on hardware and services for the smart home, a fraction of the total outlay on domestic gadgets.

There are several reasons for muted enthusiasm. Businesses have an incentive to embrace the internet of things: there are cost savings to be had from embedding sensors in equipment and factories, analysing the data thus produced and improving efficiency. A lot of smart devices for the home, in contrast, remain “fun but not essential”, says Adam Segar of Canary, a startup that makes cameras that lets people monitor what is happening in their house.

Many smart gadgets are still too expensive. One of Samsung’s smart fridges, with cameras within that check for rotting food and enable consumers to see what they are short of while shopping (through an app on their phone), sells for a cool \$5,000. People who can afford that probably don’t do their own shopping. Appliances such as fridges are also ones that households replace infrequently: that slows the take-up of new devices.

The technology is not perfect yet, either. The smartphone, the link between the customer and smart-home device, has raised consumers’ expectations, explains Jamie Siminoff, the boss of Ring, a startup that ▶▶

Job opening: The Economist is looking for an investigative reporter to work at its headquarters in London. Research and analytical skills, an ability to write informatively, succinctly and wittily, and insatiable curiosity are essential. Prior investigative experience would be an advantage. Applicants should send a CV, a brief letter introducing themselves and an article of about 600 words that they think would be suitable for publication in the business section to investigatejob@economist.com. The closing date for applications is July 1st 2016.

▶ makes a doorbell that can be answered remotely. Smartphones have trained users to expect a level of quality and seamless ease of use that smart-home devices struggle to replicate. And a lack of standardisation means that gadgets from different firms cannot communicate with each other.

There are exceptions. Devices that are easy to install and offer obvious benefits are gaining in popularity, such as motion sensors that send alerts when windows and doors are opened and cameras to monitor activity. Some devices, such as smart smoke detectors, are in homes because insurance companies offer financial incentives for using them. The smart-home sector is vibrant with startups and big firms betting that the hesitancy is temporary. But consumer apathy has forced firms to rethink how they might woo customers.

Perhaps the biggest surprise is that Amazon, which failed miserably in its ambition to develop a smartphone, is showing the way. Amazon Echo is a smart speaker that can recognise and respond to voice commands. It shares information about the weather and sports scores, plays music and turns lights on and off. The device, which costs around \$180, is not yet a big seller. Amazon does not release sales figures, but Strategy Analytics estimates that fewer than 1m Echos have been sold since it was released in November 2014. Yet the Echo is the talk of Silicon Valley.

Talk to your appliance

An interface that relies on voice commands could overcome one of the drawbacks of the piecemeal approach to the smart home, by becoming the standard integrator of all the other bits of smart kit. Echo is open to outside developers, who can come up with all manner of devices and services that hook up with it. Echo's success may have come as a surprise, but competitors have cottoned on that it may be a crucial piece of equipment. Google has announced plans to build a stand-alone hub like Echo, called Google Home, which will also rely on voice commands.

Apple is also expected to announce new smart-home capabilities: there are rumours it could launch a stand-alone hub in the Echo vein at its annual developers' conference on June 13th. Its smart-home platform, called HomeKit, has been a failure so far. That Apple, despite its large base of affluent acolytes, has not yet cracked the smart home is a sign of its difficulty, points out Geoff Blaber at CCS Insight, which tracks mobile-industry trends.

Each tech giant has a different reason for trying to overcome the indifference of consumers, and to embed itself more deeply in the home. The Echo can help Amazon learn how people spend their time, and make it easier for them to spend money too by suggesting things they might buy. Google, whose main business is ad-

vertising, also wants to draw from a fresh well of data; by learning as much about users as possible, it can target them with appropriate ads. Apple, with a track record of simplifying and creating ecosystems where others before it could not, wants its devices to be the gateway through which people go to organise their lives.

If the tech giants retain their ambition to sit at the centre of the smart home, uncertainty prevails over where the profits lie. "It remains unclear what the economic

model for the smart home will be," says Andy Hobsbawm of Evrythng, an internet-of-things platform. Some firms will try to make enough profit just from hardware. Others will try to sell services, such as archiving security videos, as well as devices, and charge a fee. The products that fill houses are diverse, personal and durable. That should give plenty of companies a shot at lodging themselves in the home—but only when consumers decide to put out the welcome mat. ■

Google's other businesses

Alpha minus

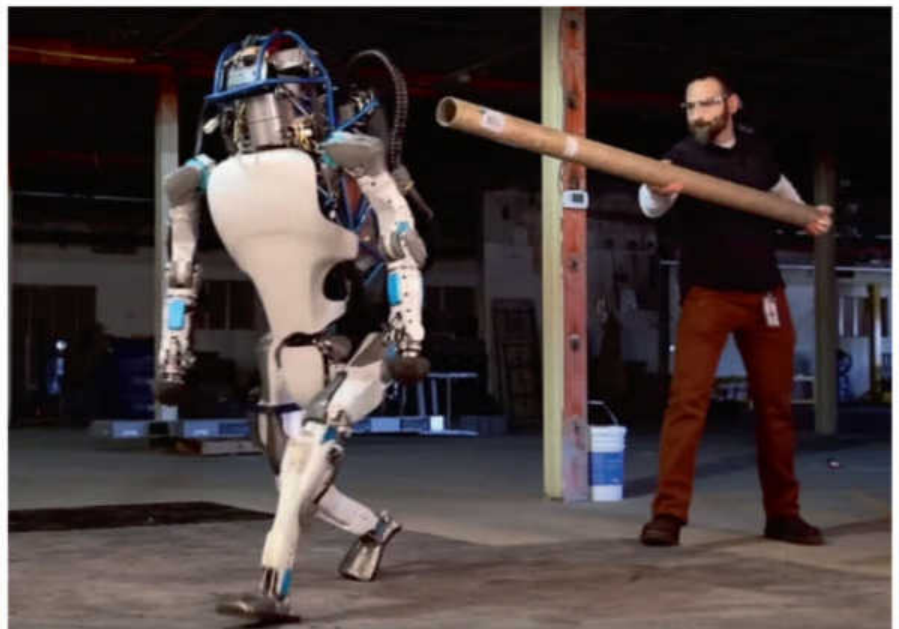
Alphabet is still working out how to treat its internal startups

“EMPOWERING great entrepreneurs and [allowing] companies to flourish.” This was one of the reasons Larry Page, the co-founder of Google, gave when he announced almost a year ago that the firm would restructure itself. Google, which comprises the internet-search and advertising business, now sits as a subsidiary in a holding company called Alphabet, alongside the “other bets”, a dozen startup businesses that range from fibre networks and smart cities to robotics and life sciences. Yet for now at least, the flourishing is limited and the entrepreneurs seem somewhat less than empowered.

When Tony Fadell, the boss of Nest, which makes wireless thermostats and other “smart home” devices (see previous article), resigned last week, it was not only

because of Nest's disappointing results and his abrasive management style, but the fact that he no longer got along with Mr Page. Even before Alphabet was launched, Andy Rubin, who ran the company's robotics business, also stepped down, apparently because he was bored (he now runs an incubator of hardware startups called Playground). One of the firms he persuaded Google to buy is Boston Dynamics, a maker of artificial dogs and other scary-looking mechanical beasts (see picture). Its founder, Marc Raibert, is known to cherish his autonomy.

That may help explain why Boston Dynamics is now up for sale. An uncertain path to profitability may also play its part in that decision. The firm's automatons are a hit on YouTube, but internally Alphabet ▶▶



Who's the Terminator now?

► thinks it will take another decade before they can be put to commercial use.

Herding entrepreneurs is hard. And bets on new technologies are risky. Yet Alphabet is grappling with a problem that has already troubled many other big tech firms: how much freedom, money and time to give internal startups. As much as it is designed to give entrepreneurs their head, the holding structure is also meant to create more clarity about how much is invested in riskier bets. As such, it marks the beginning of what Mr Fadell has called a “fiscal discipline era”.

The core Google business is growing nicely and is highly profitable, but the other “moonshot” businesses keep losing money. How much exactly is hard to say because Alphabet only publishes consolidated numbers for these ventures. In 2015 the combined losses for the non-Google businesses hit \$3.6 billion on revenue of just \$448m. That is a drop in the bucket for Alphabet: it generated \$75 billion in revenues and \$16.3 billion in profits last year. But a structure that focuses investors’ attention on how these other bets are going may limit flexibility as much as enable it. ■

Marketing rebates

Trust me

Advertising agencies are accused of serving themselves

JUNE is usually a cheerful month for admen: they are scheduled to celebrate their feats at the humbly titled Cannes Lions International Festival of Creativity, which starts on June 18th. Yet the get-together this year may be abuzz with darker talk. On June 7th America’s Association of National Advertisers (ANA), a trade group for marketers, published a report accusing advertising agencies of accepting rebates, or kickbacks, from media companies. A group representing American ad agencies slammed the report as “anonymous, inconclusive, and one-sided”. The brawl is sure to continue.

The ANA’s report is the culmination of years of conjecture about such rebates, whereby media companies reward agencies for buying chunks of ad space by giving them cash, fees or other benefits. In some countries advertisers know of such rebates and plan for them. In America the practice has haunted the industry.

Big advertising holding companies such as WPP, which owns several big ad agencies, deny the existence of rebates. Others in the industry say rebates are a shadowy practice, undermining clients’ interests. Last year a former WPP executive

Fosun

Bloated but still bingeing

SHANGHAI

China’s leading industrial conglomerate needs to shed debt

GUO GUANGCHANG made headlines around the world in December when the billionaire industrialist suddenly disappeared, supposedly to cooperate “voluntarily” with Chinese anti-corruption investigators at a secret location. Shares in his company, Fosun, China’s biggest private-sector conglomerate, tumbled. Potential takeovers abroad began to unravel. He was released without accusation of wrongdoing, but the incident served as a warning about political risk in China. Mr Guo recently downplayed the incident: “Half a year has already passed... we are back to normal.”

That is not the good news it seems, because “normal” involves an even bigger risk. Fosun has vast debts after an orgy of foreign acquisitions that has cost, by one estimate, around \$30 billion. In recent years, it has acquired France’s Club Med, a resort operator, and bought stakes in Britain’s Thomas Cook, a travel agent, and in Canada’s Cirque du Soleil, an entertainment troupe.

Fosun has also been buying insurance firms worldwide. That is not going entirely smoothly. It confirmed on June 4th that one recent acquisition, of Bermuda-based Ironshore, is being reviewed by an American agency that handles national-security matters. Inspired by Warren Buffett’s business model, Mr Guo is buying insurers to use the “float”, money held to pay future claims, to invest in other businesses in the meantime.

This binge led Standard & Poor’s to downgrade Fosun’s debt to negative on June 4th. The ratings agency pointed to the rise in the firm’s ratio of debt to EBITDA (a measure of profitability) for its industrial operations from 9.1 in 2014 to 16.8 last year. It also noted that industrial operations still accounted for over four-fifths of Fosun’s consolidated revenues at the end of 2015, suggesting that a transformation into China’s Berkshire Hathaway

declared rebates to be widespread. In October the ANA hired an independent company, K2, to investigate.

Its report has fanned advertisers’ fears. Based on interviews with 150 anonymous sources, K2 found that rebates are delivered both in cash and in subtler forms. For example, media firms pay fees to agencies for services, such as research, that are often nominal or not provided at all. This is worrisome for clients for at least two reasons. Unbeknown to them, agencies might pocket rebates that should presumably be



Aiming high

has not quite come off, yet.

Mr Guo is understandably keen to reassure investors. In his most recent letter to shareholders, he vowed the firm would “optimise the debt structure so as to reduce financing cost”. He also claimed recently that he has a “clear plan” to upgrade his firm’s debt to investment-grade “as soon as possible”. This too is not the good news it seems. His plan involves lots of new acquisitions.

The Chinese tycoon says he plans to shift his focus to deals in big emerging markets. On June 6th reports emerged that Fosun’s offer of \$1.3 billion to acquire India’s Gland Pharma is the highest bid from the firm’s suitors. But it continues to expand in the rich world, too. News surfaced this week that it is bidding for a stake in Compagnie des Alpes, another European tourism firm.

Despite the mountain of debt, Mr Guo vows to turn his firm into “the world’s leading service provider... of health, wealth and happiness” within a decade. If he means it, investors in Fosun may end up less worried about the disappearance of Mr Guo than that of their money.

Or a client might find itself spending money on a certain ad, not because it fits its marketing strategy but because it allowed the agency to gain a rebate.

Such findings would stretch even the strongest bond between advertiser and agency. But the relationship is already frayed. Advertisers have long squeezed fees to agencies and remain wary of wasting money. The complexity of the digital ad industry is partly to blame. It is hard to track which fees are paid to which vendors. Too often ads are fraudulently fun- ►►

►neled to robots rather than people.

There is broader concern, too, over conflicts of interest. K2 pointed to holding companies directing advertisers' spending to firms in which they had invested, as well as buying media space and reselling it to clients at a 90% mark-up. K2's report reinforces the fear that an agency's remit to serve clients might clash with a holding company's duty to shareholders. "There may be lots of transactions that are not necessarily done with the best interest of the marketer in mind," argues Bob Liodice, president of the ANA.

Whether the report will lead to legal action remains unclear. K2 did not condemn any company by name, nor label any activ-

ity as fraudulent in its study. Agencies may not even have violated the terms of their contracts.

Nevertheless, the relationship between advertiser and ad agency may become increasingly hostile. Advertisers are likely to become stingier with their budgets, reckons Brian Wieser of Pivotal Research Group, a research firm. They may also seek stricter terms. In April a British advertisers' trade group published a new template for contracts, including broad rights to audit agencies. The ANA is now developing its own scheme, to be finalised by the end of June. Advertisers are likely to think much longer and harder before signing on the dotted line. ■

Household chemicals in South Korea

The germ of an idea

SEOUL

A probe into deadly disinfectants spurs South Koreans to go green

“HARMLESS to humans”, assured the slogan on humidifier disinfectants sold to South Koreans in the early 2000s by Oxy, a local unit of Reckitt Benckiser, an Anglo-Dutch consumer-goods company. A widening criminal investigation by South Korea's government into dozens of cases of lung disease, some of them fatal, suggests the opposite. It is now examining compensation claims by another 750 victims, on top of the 530 lodged since 2011.

Chemical sanitisation in homes and offices is prized as a sign of the country's rapid progress since its economic take-off in the 1980s lifted millions from squalor and disease. Killing germs, says Lee Duckhwan, a professor of chemistry and com-

munication at Sogang University in Seoul, became the “single most important topic of daily discussions” in the 1980s. Since then, everything from baby soap to washing machines has claimed to act as a steriliser—something Mr Lee decries as “phobia marketing”. So it is a particular blow when it turns out that products which should improve cleanliness might do harm.

The government suspended sales of the disinfectants sold by Oxy and three other local companies in 2011, after an investigation into the deaths that year of four pregnant women suggested poisonous chemicals in their products were the cause. A government study recently revealed that exposure to the sterilisers had multiplied

the risk of severe lung damage by 116 times. Prosecutors charged three executives at Oxy in May with shirking toxicity tests on the disinfectant. On June 7th John Lee, formerly head of the local unit of Reckitt Benckiser and now boss of Google Korea, was summoned again by prosecutors for another round of questions about the toxic steriliser. South Koreans are incensed that it has taken so long for the government to act, despite their protest campaigns. In the decade after 2001 South Koreans bought over 4.5m of Oxy's suspect products.

In quick succession in late April, two South Korean retailers who sold the disinfectants under their own brands—Lotte Mart and Homeplus—issued apologies and promised compensation, followed by Oxy itself, which, for the first time, accepted the “fullest responsibility”. Retailers have stopped ordering Reckitt Benckiser products altogether. The government recently said that it had reviewed 15,000 products, from deodorisers to detergents, and had banned seven biocides, the compounds that kill germs, for containing prohibited chemicals.

Nevertheless, the scandal is starting to change the way South Koreans shop. Consumers are shunning laundry liquids, wet wipes and air fresheners. E-Mart, another retailer, says sales of bleach fell by 38% in the three weeks following Lotte's apology; dehumidifying detergents dropped by almost half. Long-standing customers of Dure Co-op, a network of organic shops in the Seoul region, say even they use chemical detergents because they are more effective at killing germs. But since the scandal they have dumped their Oxy products in a dedicated box at the entrance to the store. Those who do can buy Dure's alternative cleaning products at half-price, among them an air freshener made from citric acid and plant-derived anti-microbials.

The manager of the co-operative says that more have been buying up “green” household products, especially since the “no-poo” movement, which renounces shampoo, caught on in South Korea last year. South Korean newspapers now refer to this new group as the “no-chemi clan”. Some even make their own products: Bae In-suk is one of ten mothers who meet up regularly in Seoul to make facial soaps since the Oxy scandal has mushroomed.

Mr Lee says the government's recent promise to catalogue the level of toxicity of every household biocide is impractical. So too, he says, is the no-chemi movement—it is better to educate consumers about how to use products safely. Hwahae, a cosmetics-reviewing app launched in 2013 (by three men who wanted to know what exactly was in their facial products) has already clocked up 2.5m downloads. It lets consumers read up on 1.9m ingredients in 62,000 items. It is always good to know what you are rubbing on your face. ■



No more soft-soaping



Airlines in South America

No El Dorado

Why the continent's airlines are losing so much money

WHEN phone footage came to light last year of a stripper opening the throttle during the take-off of a commercial jet operated by Aerolíneas Argentina, the public outcry was predictably fierce. Argentina's state-owned flag carrier swiftly sacked the pilots who had invited her into the cockpit and the lady herself was banned from the airline for five years. Endangering the safety of passengers is a serious concern. Yet the company's assault on the public finances is almost as reckless: Argentines have tolerated vast subsidies and huge losses at their national airline.

Even without the drag of state ownership, other South American airlines have recently either lost money or made only meagre profits (see chart). Airlines in Latin America as a whole (whose performance is flattered by the inclusion of Mexico's mostly profitable flyers) even surpassed Africa's beleaguered carriers in their ability to lose money in 2015, according to IATA, an industry body. That marks them out at a time when the tailwinds of growing passenger numbers and cheap fuel have carried many other airlines to unusual heights of profitability.

The region's airlines don't lose money because flights are cheap. Air fares are eye-wateringly pricey—an internal flight in Brazil can cost as much as one to Europe. Travellers have not benefited from the ascent of low-cost carriers (LCCs) because budget airlines are thin on the ground. Outside Brazil's domestic market, where Azul and Gol carry passengers between the country's far-flung cities, there are few LCCs and

their impact has been limited. As a result, the continent's growing middle-classes have not taken to the skies as enthusiastically as in the rest of the world.

This is partly attributable to a lack of infrastructure. There are few secondary airports of the sort frequented by LCCs in Europe or specialist low-cost terminals at bigger airports that are common in Asia. That lands LCCs with the same high airport fees as big carriers. Gol, the largest Brazilian LCC, made a loss of 4.29 billion reais (\$1.3 billion) in 2015.

In some countries, budget carriers have been kept at bay by state-run incumbents. Cash-rich left-wing governments in the region set up or revived flag carriers as money poured in when commodity prices were high. In Bolivia and Venezuela state-owned airlines are virtually the only

means of domestic air travel. Appointing cronies has ensured inept management.

The standard of service on state airlines is often woeful. Aerolíneas cancels three times more flights than the industry average, and loses roughly twice as many bags. Venezuelan travellers have the added problem that foreign airlines are leaving the country in a dispute over how to repatriate money from sales because the government cannot find the dollars to pay them for tickets issued in the country.

Elsewhere publicly listed airlines provide much better service but are just as hard to dislodge. LAN Chile set up subsidiaries in Peru, Argentina, Ecuador and Colombia before merging with TAM, Brazil's biggest airline, in 2012. LATAM is now the largest airline across swathes of the continent. In smaller markets such as Peru, Chile, and Ecuador LATAM and Avianca, a Colombian carrier, already have big networks that leave little space for LCCs to operate domestically. Barriers to entry are high: dealing with a slew of differing regulations makes setting up new cross-border routes expensive.

Why then are the incumbents not making more money? LATAM lost \$219m in 2015; Avianca lost \$140m. As passenger numbers grew during the commodities boom, most airlines ordered lots of expensive new planes. But just as they arrive on the tarmac, demand for air travel is stumbling. South America is still reeling from the bursting of the commodities bubble. This has hit domestic and cross-border air travel alike. Worries about the spread of the Zika virus have also deterred visitors to the continent. In 2016 growth in passenger traffic in Latin America is likely to lag every other region, according to IATA.

Some of the continent's politicians have woken up to the industry's structural problems. In Argentina, Mauricio Macri, the victor in November's presidential election, has announced plans to withdraw a \$500m subsidy from Aerolíneas. The airline's new management plans to cut capacity and return to profit by 2020. Brazil is negotiating with the EU for an "open-skies" deal that would boost competition by allowing airlines from those countries to serve any airport in Brazil. Before her impeachment the country's president, Dilma Rousseff, was said to be considering raising the share foreigners can own in local airlines from 20% to 100%, allowing better-run foreign carriers to buy domestic ones.

Michel Temer, Brazil's interim president, is also said to be considering a relaxation of foreign-ownership rules. And intrepid budget carriers will doubtless try to overcome the difficulties and set up routes in more countries. But unless more politicians in the region turn their attention to aviation, South America will continue to be the continent of sky-high fares and limited choice. ■



Schumpeter | Their eyes on Albion

Most European bosses are twitchy about Brexit; a few spy an opportunity



YOU do not have to be British to take a view on Britain's place in Europe. Almost every global economic institution has predicted damage if Britain leaves the European Union. Barack Obama pooh-poohed Brexiteers' hopes of striking a quick bilateral trade deal with America, deflating those who claim exporters would flourish outside the EU. Jamie Dimon, the boss of JPMorgan Chase, a big American bank, has called Brexit a "terrible deal for the British economy". Those with European accents are no more impressed. Angela Merkel, Germany's chancellor, has warned Britons that trading with the EU itself might prove hard from outside the fold. On May 31st Europe's biggest businesses chimed in: leaders of 51 large firms—claiming collectively to have created jobs for some 7m people—said a split would diminish both Britain and Europe as a whole.

These big firms, convened as a "European Round Table of Industrialists", are led by Benoît Potier, a knight of the French Legion of Honour and the boss of Air Liquide, an industrial giant. Lectures from a titled Frenchman who knows about gases are unlikely to win over wavering voters in the referendum on June 23rd. Those tempted by Brexit are swayed by emotions: fears of foreigners; romantic ideas of sovereignty; Trumpian calls to reverse globalisation. Rational comments from moderate business folk, let alone French ones, pluck few heartstrings.

Nor is it clear that this group of bosses speaks for everyone on the continent. Schumpeter has spent the past six months asking owners, CEOs, bankers and others in European business what they make of Brexit. They fall into three groups. One lot, a minority, assumes it is not—and never was—a serious prospect, despite some polls in Britain now suggesting the Leave camp is ahead. A phlegmatic Swedish banker, paid to assess political risk and how currencies might move, says he and colleagues rate the chance of rupture at almost zero. Consumer-research and polling companies across Europe recently concluded that few of the businesses they work for expect any change.

Those who rely on British custom—French property agents selling holiday homes, for example—count Brexit as only one worry of many, along with falling bank bonuses in London, strikes, floods and terrorism. "Spaniards are more worried about the Euro 2016 soccer tournament," says José Maria de Areilza, a

professor at ESADE, a business school in Barcelona.

A second and larger camp sees Britain's departure as realistic and a serious threat, for a variety of reasons. Jacob and Marcus Wallenberg, two Swedish industrialists, voiced their fears a year ago that without London as a counterweight to Paris and Berlin the EU would gradually become unfriendlier to business. Others worry about the direct impact on investments in Britain. Both BMW and Nissan have said Brexit would hurt their operations in the country. A representative of one big multinational firm says it has been weighing up contingencies for months, as 80% of production at its British car plants goes to the EU. Given thin profit margins and the risk of tariffs, currency swings or other barriers to trade, it would shift new investment to the continent.

The first secession since Greenland quit the European Economic Community in 1985 might do even broader damage, by some reckonings. The Paris-based boss of a big car-parts supplier says the main risk is the triggering of wider instability, the "unravelling" of continental institutions and talk of exit by others. Confindustria, Italy's bosses' association, says that it does not know of a single CEO in favour of Brexit but that some fret about an "avalanche effect" of turbulence in capital markets and uncertainty in trade negotiations that could cost businesses dearly.

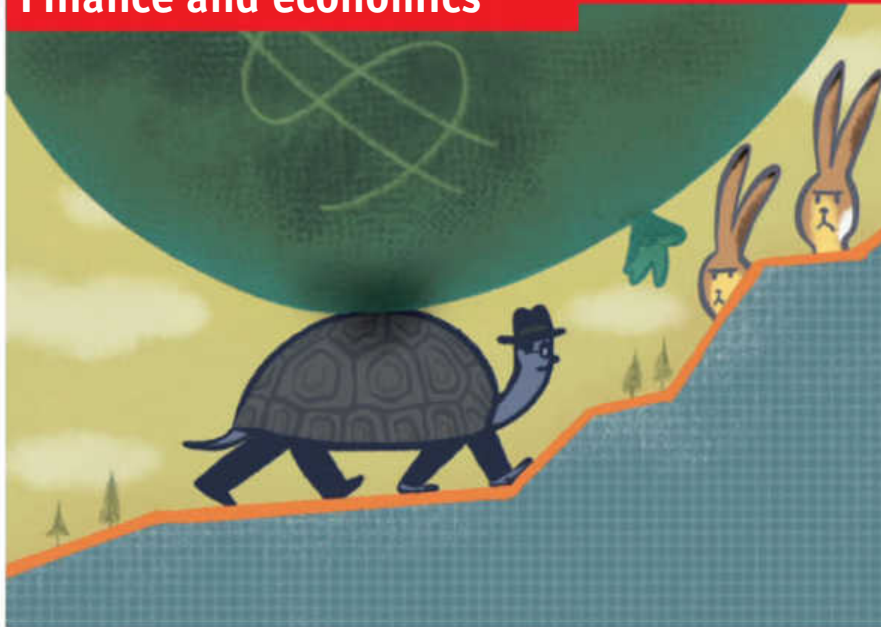
There is a third group, however. This camp, the least outspoken, is contrarian. Some spy short-term opportunities: a few hedge funds are commissioning private exit polls on the day of the referendum in order to make bets in the currency markets. But others think that Brexit will yield bigger, long-term payoffs.

Many in this third group serve the finance industry. Brexit would weaken London, as jobs and business drift to Paris or Frankfurt. HSBC has said it might shift 1,000 investment bankers from London to Paris, if Britain goes it alone. JPMorgan Chase reckons 4,000 staff might be moved to the continent. Property will be needed and IT systems procured from local firms. French lawyers and accountants might replace British ones. And as bankers arrive everyone from estate agents with palatial homes on their books to bar owners can expect a boost to their business.

Other businesses also see advantages from Brexit. Some firms in Switzerland like the idea of another economy becoming semi-detached, believing it could be easier for the Swiss to negotiate with the EU if Britain were in a similar position. A poll of 185 companies in March by the British-Swiss Chamber of Commerce found 13.5% believed Brexit would improve their fortunes. Universities on the continent, especially those that teach in English, could profit if EU students turn away from Britain. "No way will I send my daughter to study in London after Brexit," says the mother of one teenager in Paris, predicting that fees in Britain would soar without EU caps. Jean-Christophe Babin, boss of Bulgari, a luxury-goods firm, says he would be untroubled by Brexit for different reasons: if the pound slumped, tourists would boost sales at his new flagship shop in London.

Lose an island, seize an opportunity

Polls suggest that public opinion in Europe expects and favours Britain voting to remain in the EU. Even the traditionally snooty French want their neighbours to stay, despite resenting Britain's exemption on EU financial regulation, and its absence from the Schengen area for passport-free travel and the single currency. Most businesses on the continent are in the Remain camp, too. They see Brexit as, at best, a pain; and at worst, a threat. But the few that stand to gain would happily wave farewell to the Brits. ■



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Asset management

Index we trust

Vanguard has radically changed money management by being boring and cheap

WHEN John Bogle set up Vanguard Group 40 years ago, there was no shortage of scepticism. The firm was launching the first retail investment fund that aimed simply to mimic the performance of a stock index (the S&P 500, in this case), rather than to identify individual companies that seemed likely to outperform. Posters on Wall Street warned that index-tracking was “un-American”; the chairman of Fidelity, a rival, said investors would never be satisfied with “just average returns”; and the Securities and Exchange Commission (SEC), Wall Street’s main regulator, opposed the firm’s unusual ownership structure. The fund attracted just \$11m of the \$150m Vanguard had been hoping for, and suffered net outflows for its first 83 months. “We were conceived in hell and born in strife,” Mr Bogle recalls.

Vanguard now manages over \$3.5 trillion on behalf of some 20m investors. Every working day its coffers swell by another billion dollars or so. One dollar in every five invested in mutual or exchange-traded funds (ETFs) in America now goes to Vanguard, as does one in every two invested in passive, index-tracking funds, according to Morningstar, a data provider. Vanguard’s investors own around 5% of every public company in America and about 1% in nearly every public company abroad. Although BlackRock, a rival, manages even more money, Vanguard had net retail inflows of \$252 billion in 2015, more than any

other asset manager.

Impressive as they are, however, these statistics still understate Vanguard’s influence. By inventing index-tracking, and providing it at very low cost, the firm has forced change on an industry known for its high margins and overcomplicated products. Delighted investors and disgruntled money managers speak of “the Vanguard effect”, the pressure that the giant’s meagre fees put on others to cut costs. Some rivals now sell passive products priced specifically to match or undercut it.

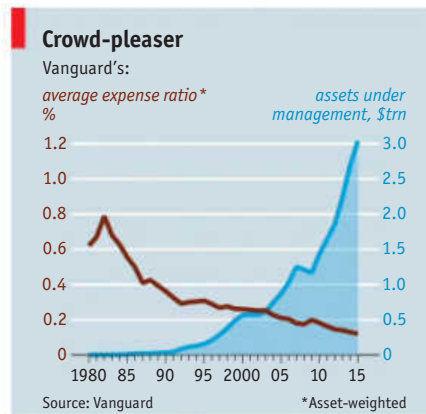
Ask any employee for the secret of Vanguard’s success, and they will point to its ownership structure. The firm is entirely owned by the investors in its funds. It has no shareholders to please (and remuner-

ate), unlike the listed BlackRock or Fidelity, a privately owned rival. Instead of paying dividends, it cuts fees. Mr Bogle’s rationale for this set-up is simple: “No man can serve two masters.” The incentives of the firm and its customers are completely aligned, he says. Competitors implicitly agree. “How are we supposed to compete when there’s a non-profit disrupting the game?” complains one.

Bill McNabb, Vanguard’s current CEO, says the ownership structure permits a virtuous cycle, whereby its low fees improve the net performance of its funds, which in turn attracts more investors to them, which increases economies of scale, allowing further cuts in fees. Even as the assets Vanguard manages grew from \$2 trillion to \$3 trillion, its staff of 14,000 or so barely increased. Meanwhile, fees as a percentage of assets under management have dropped from 0.68% in 1983 to 0.12% today (see chart). This compares with an industry average of 0.61% (or 0.77%, when excluding Vanguard itself). Fees on its passive products, at 0.08% a year, are less than half the average for the industry of 0.18%. Its actively managed products are even more keenly priced, at 0.17% compared with an average of 0.78%.

The index-trackers account for over 70% of Vanguard’s assets and over 90% of last year’s growth. Investors are gradually absorbing the idea that, in the long run, beating the market consistently is impossible, Mr McNabb says. That makes being cheap more important than being astute. Last year investors in America withdrew \$145 billion from active funds of different kinds and put \$398 billion into passive ones.

“In an industry with serious trust issues, Vanguard has proven an exception to the rule,” says Ben Johnson of Morningstar. Its investors stay with it roughly twice as long as the industry average. The firm ac- ▶▶



tively shuns short-term “hot money” because it brings extra trading costs. Mr McNabb tells the tale of the CEO of a foundation who wanted to park \$40m with a Vanguard fund for a few months. When the fund turned him away, he “went ballistic”, complaining to the SEC, but Vanguard did not budge.

Vanguard also insists on keeping things simple. It offers only 70 different ETFs, compared with 383 at BlackRock. It steers clear of vogueish products, such as funds of distressed energy firms. It refused, presciently, to set up an internet fund in the late 1990s.

But Vanguard’s conservatism can also

be a weakness. It has been slow to expand abroad: its customer base is 95% American. It was slow to get into ETFs as well, allowing BlackRock to become the biggest provider, although Vanguard is catching up. BlackRock is also a one-stop shop for all manner of investments, including alternatives such as private equity and hedge funds, whereas Vanguard caters only to the mainstream. This may be one of the reasons why it does less well with the biggest institutional investors, which want lots of investment options and the kind of bespoke service that Vanguard does not offer.

There is always a chance that a clever

fintech startup, or a tech giant like Apple, might create a cheaper or simpler way for individuals to invest, luring away some of Vanguard’s customers. As it is, it is getting harder for Vanguard to keep cutting fees: to shave its average fee by a hundredth of a percentage point, it needs to attract an extra \$560 billion in assets under management. And heavier regulation is always a risk. Last year the industry’s giants won an important battle when they convinced regulators that, unlike banks, fund managers should not be subject to more onerous rules simply because they are big. But talk of rules intended to stem panic in collap- ▶▶

Buttonwood | Secret agents

A new book argues that the finance industry needs reform

WHAT is the purpose of the finance industry? Everyone knows that it provides a very good living for many of its employees and that it is prone to occasional crises that can disrupt the global economy. But what good does it do the rest of humanity?

A new book* by Stephen Davis, Jon Lukomnik and David Pitt-Watson lists four main roles for the industry: providing safe custody for assets, a payments system, intermediation between savers and borrowers, and risk reduction (insurance). Its performance should be judged by its success or failure in providing those services.

The financial crisis in 2007-08, when many banks had to be rescued by governments, shows that finance does not always do a bang-up job of providing safe custody. Banks were allowed to gear up their balance-sheets in pursuit of short-term profits—not a good deal from society’s point of view. There has also been an explosion in the volume of securities trading in recent decades. But it is not clear how that helps the economy: liquid markets are a virtue, but do deals really need to be executed in milliseconds?

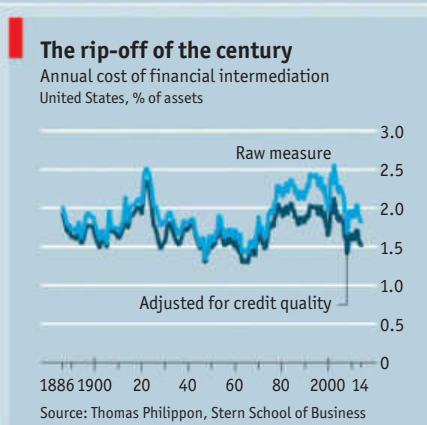
Another important issue is how efficiently the finance industry provides those services. The authors refer to a recent paper** by Thomas Philippon of New York University which tried to measure the unit cost of financial services over time. This is a tricky business given the complexity of the industry; Mr Philippon divides the income of the sector by the quantity of the assets it intermediates. On that reckoning, the costs of intermediation have stayed roughly constant at between 1.5-2% (see chart). In other words, finance is no more efficient than it was at the end of the 19th century.

Financial titans might splutter into

their champagne at Mr Philippon’s finding, and point to the reduction in trading spreads or even the rise of firms like Vanguard. But it is the cost to the end-user that is the key. Mr Philippon’s data suggest that money saved in one area has been offset by new charges elsewhere.

In particular, Messrs Davis, Lukomnik and Pitt-Watson point to the multiple layers of intermediaries that take a chunk out of a saver’s money. Invest your pension in a mutual fund and you may pay a record-keeper to check your savings are going to the right place; the mutual-fund manager; the third-party research firms that fund managers pay to help them select stocks; the platform on which the mutual fund is listed; the broker who handles the fund’s orders to buy and sell when it trades shares and bonds; a custodian to look after those securities; and an agent to price them for reporting purposes.

Those charges add up, and make an enormous difference. If a 25-year-old saves for 40 years for a pension, paying fees of 1% a year, the accumulated charges will reduce his or her retirement pot by a quarter (based on the average dollar being in the



pension for 25 years). Annual charges of 1.5% will result in a 38% cut. In a world where many people have defined-contribution pensions, and there is no pledge from the employer to provide a decent income in retirement, such charges are very important. But employees may not be fully aware of the “price” they are paying for the management of their savings.

Why hasn’t regulation eliminated these problems? The authors think regulators have pursued a policy of “whack-a-mole”: identifying specific problems after they surface and then producing elaborate rules in response. The result is too much detail: new American credit cards come with 31 pages of legalese. Instead regulators should adopt a more systemic approach, focusing on the “fiduciary duty” intermediaries owe to their clients and making sure that clients are aware of all the costs that are loaded onto them.

In the authors’ ideal world, banks should hold more capital to ensure the safety of deposits; stock exchanges should be prevented from giving high-frequency traders faster access to market prices; and executives should be paid bonuses linked to the long-term growth of the business rather than the share price. Above all, they argue, the interests of the underlying clients of the finance industry—the depositors, the workers and the pensioners—should come first. Everyone is a capitalist these days. That means keeping a much closer eye on those who manage that capital.

* “What They do With Your Money: How the Financial System Fails Us and How to Fix It”, Yale University Press

** “Has the US Finance Industry Become Less Efficient? On the Theory and Measurement of Financial Intermediation” http://pages.stern.nyu.edu/~tphilipp/papers/Finance_Efficiency.pdf



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ing markets has not gone away.

Nonetheless, there is plenty of room for Vanguard to keep growing. Only a third of American equities are held by index-tracking funds, and a smaller share elsewhere. Regulators in America and beyond are discouraging or barring financial advisers from receiving commissions from firms whose products they recommend—a move that should push even more money to Vanguard as advisers lose the incentive to offer expensive products (Vanguard refuses to pay commissions).

As the move from defined-benefit to defined-contribution pensions continues, and as Asia sets up its retirement systems, there will be growing demand for the sort of “DIY” investing that has underpinned Vanguard’s success. With interest rates and investment returns expected to be low for years to come, keeping fees down will be more important than ever. As Tim Buckley, the firm’s chief investment officer, puts it: “The biggest advantage Vanguard has, aside from its structure, is the greed of our competitors.” ■

farious youths fleecing aged relatives.

In a witness statement, Catherine McDougall, who was seconded to the LIA at the time from Allen & Overy, a law firm, says it was “readily apparent” that Goldman “had unfairly taken advantage of the LIA’s lack of financial sophistication”. She was “particularly shocked” when she saw a Goldman banker “explaining the basics of a put and call” to Mustafa Zarti, the LIA’s deputy chief, “when he had just sold \$1 billion worth of complex derivatives” to the authority. (On discovering the toxicity of the trades, Mr Zarti would later lose his cool, shouting at the Goldman team “curses... along the lines of ‘Fuck your mother, fuck you and get out of my country’”, Ms McDougall recalls.)

Goldman is girding for battle in court, though with some of the internal e-mails that are set to be aired said to be unedifying, not to say culturally insensitive, the bank may not be relishing the prospect of a public face-off. Goldman vigorously denies the LIA’s claims that it improperly encouraged or influenced the fund or abused a position of trust. It says their relationship was at all times an arm’s length one. It calls the case “a paradigm of buyer’s remorse”.

As for the internship, Goldman insists it was a normal part of training programmes it offered to the LIA and did not breach Goldman’s compliance rules. Internships have become touchy issues for banks since regulators, led by America’s SEC, began a couple of years ago to look into whether hiring relatives of government officials or senior corporate managers might constitute bribery.

The LIA’s other big battle, against Société Générale, a French bank, involves alleged bribery of a more blatant sort. The Libyans are suing for \$1.5 billion over five disputed trades, some of them heavily ▶▶

Banks v investors

Of snowballs and red ink

Investors are going to court to reclaim losses from ill-advised derivatives deals

IT HAS been called “the worst trade ever”. Shortly before the financial meltdown of 2008, Metro do Porto and three other Portuguese public-transport companies entered into a series of interest-rate swaps with Santander, a Spanish bank, in hopes of reducing interest payments on their debts. But they soon discovered why these particular derivatives were dubbed “snowball swaps”.

The firms’ losses exploded to several times the underlying debts, and by all accounts continue to swell today. They sued Santander, but in March an English court ruled the bank’s way. Though some documents “do the bank no credit”, the judge concluded, the transport companies could have been in no doubt about the scale of risk they were taking on. Santander did not coax them into signing contracts it thought would be contrary to their interests. The companies were not its clients, owed a fiduciary duty, but its counterparties, on the opposite side of the trades.

In the go-go years before the crisis public-sector entities were sold plenty of complex derivatives that subsequently went badly wrong. Were they stupid? Were the banks that flogged the swaps and options evil? Or was it a bit of both? The snowballs case shows how difficult it can be for the likes of Metro do Porto to claim they were hoodwinked. They may be not be as financially sophisticated as their counterparties, but nor are they widows and orphans; they have plenty of money to hire experts to scrutinise term sheets.

That hasn’t stopped others from looking for ways to bring cases. Barring a last-minute settlement, on June 13th the Libyan Investment Authority, a sovereign-wealth fund, will face off against Goldman Sachs in London’s High Court. The LIA sued after losing more than \$1 billion in a series of op-

tions trades that the bank arranged for it in 2008. Goldman, meanwhile, made an estimated profit of well over \$200m.

Having watched several mis-selling cases bite the dust, the LIA is taking a novel legal approach. It argues that Goldman exercised “undue influence” to coerce its managers—whose financial expertise at the time was “extremely limited”—into “inherently unsuitable” trades, and that the deal was therefore an “unconscionable bargain”. In part, the undue influence came from Goldman arranging an internship for the brother of an LIA executive at around the time of the trades, and offering “lavish and exotic” hospitality in Morocco, the LIA claims. Though undue influence can be argued in commercial settings, it is typically reserved for cases involving ne-



It was the trades that went off the rails

▶ loss-making, in a case set for trial early next year. The transaction at the heart of the case is a payment of \$58m by the bank to a Panamanian company called Leinada that was owned by Walid al-Giahmi, a friend of one of the sons of Muammar Qaddafi, Libya's then dictator. The LIA claims this was a bribe, intended to help sway the fund's decisions, and that SocGen knew or suspected the payment was dodgy. America's Department of Justice is investigating.

Here the Libyans' legal tack is different again. They are not arguing mis-selling or undue influence, but that the payment to Leinada rendered the trades invalid because they were "part of a fraudulent and

corrupt scheme".

The French bank firmly denies the allegations. It has said the payment was for legitimate services, "including introductory, market intelligence and follow-up services, which made it easier for Société Générale to navigate the unfamiliar and difficult Libyan market". The bank says it is co-operating with the American probe. A lawyer for Mr Giahmi, a co-defendant, did not respond to a request for comment.

These cases may establish new legal avenues for investors who claim to have been duped by unscrupulous bankers. And, as one lawyer puts it, there will be "plenty of pyrotechnics" along the way. ■

America's economy

When barometers go wrong

WASHINGTON, DC

A weak jobs report belies the resilience of America's economy

AMERICA'S labour market has become a reliable source of comfort when other economic indicators dismay. When growth slowed to just 0.8% in the first quarter of the year, economists were mostly unperturbed, because payrolls were growing by over 150,000 workers a month. Wage growth was picking up. Even labour-force participation was rising, after a long period of decline.

So the news on June 3rd that the economy created a mere 38,000 new jobs in May—the lowest total since 2010—was a nasty shock. Three days later Janet Yellen, the Fed's chairman, hinted that she no longer favours raising interest rates this summer. This abrupt change of direction followed weeks of warnings from Fed officials that a rate rise was coming, perhaps as soon as the conclusion of the Fed's next meeting on June 15th. That now looks all but impossible.

The consensus forecast was for about 160,000 new jobs in May. Even accounting for 35,000 striking workers at Verizon, a telecoms firm, the shortfall was substantial (though the estimate, which has a wide margin of error, may yet be revised up). A labour-market slowdown that had seemed gentle now looks pronounced: between March and May, the economy created on average 116,000 jobs per month, compared with 222,000 in the year to February. The fizzing labour market had been tempting Americans who had given up on work back into the labour force. But participation has now handed back two-thirds of its gains since September.

The report, taken alone, was dire. But on the whole, there is much less cause for gloom. The American economy may have slowed, but remains fundamentally strong, as it is buttressed by a healthy consumer. Personal consumption, adjusted for inflation, is up by 3% in the past year, having surged in April. The University of Michigan's consumer-confidence index, which was due to be updated as *The Economist* went to press, grew strongly in May. Even before that, confidence exceeded its average during the 2003-07 boom. According to a recent Fed survey, 69% of Americans say they are "doing okay" or "living comfortably", up from 62% in 2013. What is more, the rise has been most pronounced among those with only a high-school education.

Rising wage growth helps explain consumers' cheer. Since early 2015 growth in ▶▶

Dollar imperialism

The Fed's tributaries

HONG KONG

Which emerging markets are most in thrall to America's central bank?

OUTSIDE the Federal Reserve's imposing building in Washington, DC, water cascades from two fountains shaped like chalices. Inside, the Fed's decision-making generates equally prodigious spillovers, channelling the flow of capital around the world. The consequences, especially for emerging economies, can be monumental but they are rarely elegant.

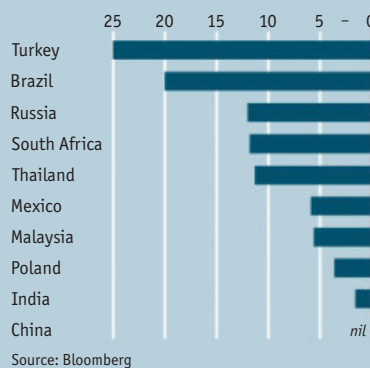
Until last week many emerging economies had been bracing themselves for an imminent rise in the Fed's benchmark interest rate, perhaps as early as this month. Higher rates could draw more money into America from emerging markets, weakening their currencies and raising their bond yields. Even the expectation of tighter money can be enough to cause trouble. In such circumstances, central banks far from the Fed often feel compelled to raise rates too, even if economic conditions at home do not entirely warrant it. In 2014 Arvind Subramanian, now the chief economic adviser to India's government, complained of "dollar imperialism".

On June 3rd, however, the emperor granted a reprieve. Surprisingly bad jobs figures released that day ended all talk of a Fed rate hike this month (see next story). American bond yields duly fell and the dollar weakened; emerging markets rallied. The numbers provided a useful test of the Fed's sway. Normally, this is hard to measure, since expectations of a rate rise cannot be observed directly and tend to evolve only gradually. The shift on June 3rd, however, was unusually stark.

Which emerging markets benefited the most? The Turkish lira and Brazilian real ended June 3rd over 1.5% stronger than the day before; the Russian rouble

Serfs up

Ten-year government bond yields, decrease on previous day, basis points
First trading day after June 2016 US payrolls release



gained over 2%; and the South African rand climbed by over 3%. The impact was surprisingly weak, by contrast, on Mexico's peso and India's rupee. Nor was there much effect on China's currency, which does not float freely, although China may yet benefit from a slower flow of capital out of the country.

The ranking of emerging-market thraldom was broadly similar for government-bond yields (see chart). Yields fell by about 0.2 percentage points on June 3rd in Brazil and Turkey. They narrowed by about half that in Russia and South Africa, as well as in Thailand when its markets opened on June 6th. China again remained in splendid isolation. And India was strangely unmoved. Its central-bank chief, Raghuram Rajan, is among the most prominent critics of the Fed's unilateral monetary power, along with his compatriot, Mr Subramanian. Yet India, on the basis of this small experiment, seems newly immune to it.

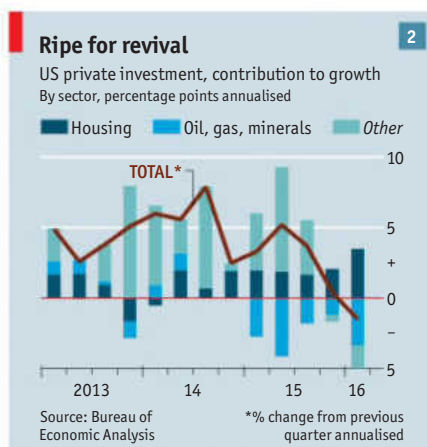
average hourly earnings has perked up from about 2% to around 2.5%. Admittedly, this is sluggish compared with wage growth before the financial crisis, which often exceeded 3%. And wage growth has plateaued as the labour market has slowed (see chart 1).

But demographic change is keeping average wage growth artificially low. The financial crisis struck when the oldest baby-boomers were nearing retirement age. As well-paid boomers retire, average wages fall. In addition, many low-wage workers, who were disproportionately likely to lose their jobs during the recession, are now returning to work, which also pulls average wages down.

Recent work by researchers at the San Francisco Fed suggests that, as of the end of 2015, these biases in entries and exits from the workforce were reducing growth in median weekly earnings by about two percentage points. Those in steady employment are faring well: the Atlanta Fed's wage index, which tracks the same individuals over time, thereby ignoring retirements and new workers, shows wage growth of 3.4% over the past year.

At the same time, Americans have been leaving petrol stations with fatter wallets, thanks to cheaper oil. Consumers did save more of the petrol-price windfall than expected. But that means that now oil prices are firming—on June 7th Brent crude surpassed \$50 a barrel for the first time since October—consumers will not have to rein in spending much in response, argues Andrew Hunter of Capital Economics, a consultancy. Indeed, savings tumbled in April as consumption rose.

Somewhat higher oil prices should also help put an end to another drag on the economy: pallid investment, which was partly responsible for the first quarter's slow growth. Investment in oil rigs and the like has fallen by almost 70% over the past two years, adjusted for inflation, as investors have mothballed shale-oil and -gas projects. But in the week to June 3rd, the rig count rose for the first time since August. Even if oil prices were to fall again, energy investment cannot drag down growth for



much longer, as it has already fallen so far.

Other business investment has disappointed, too. But rising house-building has picked up some of the slack (see chart 2). Adjusted for inflation, residential investment is up by 11% to a year ago. Government spending is also rising, after four years of pulling down growth as politicians trimmed budgets. An investment spree by state and local governments has contributed to the turnaround.

A dangerous world

Threats remain. The world economy is a worry. Europe has not yet secured its recovery (see next story), Brexit is a growing concern, and the Chinese economy remains fragile. Financial markets, which tanked early in the year on account of the world economic outlook, are sturdy for now—after Ms Yellen's dovish comments, the S&P 500 rose close to a record high. But the world economy could yet shake markets again.

Even if it doesn't, the contrast between American vigour and torpor abroad will delay interest-rate rises, argues Mark McClellan of the *Bank Credit Analyst*, a newsletter, because the Fed cannot tighten monetary policy without sending the dollar on a tear. That could itself cause renewed financial-market wobbles, particularly in emerging markets with dollar-denominated debts (see previous story). It would also dampen inflation, which remains below the Fed's 2% target, as the dollar's strength made imports cheaper.

Where next, then, for Ms Yellen? She rightly says that raising interest rates is not a goal in itself, and describes today's near-zero rates as only "modestly" accommodative—a reminder that the so-called "natural" rate of interest, the rate which neither stimulates nor dampens the economy, is probably much lower than it used to be. The Fed will probably need convincing that the latest labour-market report was an aberration before tightening policy. The next few months should provide such reassurance. Come what may, expect Ms Yellen to take only baby-steps. ■

The ECB buys corporate bonds

Unyielding

Quantitative easing in the euro area enters a new phase

TRY and try again. On June 8th the European Central Bank (ECB) started buying corporate bonds, in its latest effort to gin up inflation in the euro area. Prices declined slightly in May compared with the same month a year before; the ECB's inflation target is just under 2%. The scheme has already helped boost the zone's corporate-bond market. Doing the same to its economy looks a tall order.

The purchases form part of the ECB's quantitative-easing programme, under which it is already buying €80 billion-worth (\$91 billion) of public-sector bonds, covered bonds and asset-backed securities monthly. (Government debt, of which the ECB has amassed more than €800 billion, accounts for most.) To qualify, corporate bonds must be investment-grade and issued by euro-area firms other than banks.

Analysts reckon that €600 billion-plus of bonds fit these criteria. The bank hasn't yet said whose debt, or how much, it will buy; from mid-July it will report holdings weekly. According to Bloomberg, first-day purchases included bonds issued by Anheuser-Busch InBev, the world's biggest brewer; Generali, an Italian insurer; Siemens, a German engineering giant; and Telefónica, a Spanish telecoms firm.

The ECB is likely to be a hefty buyer. It can acquire bonds in the primary or secondary market, and can hold up to 70% of an issue. Some analysts guess it might snap up €5 billion-10 billion a month. That may be a stretch. Even if it bought a quarter of the likely total of this year's eligible issues, calculates Suki Mann of CreditMarketDaily.com, a website, that would still only work out at €4 billion a month.

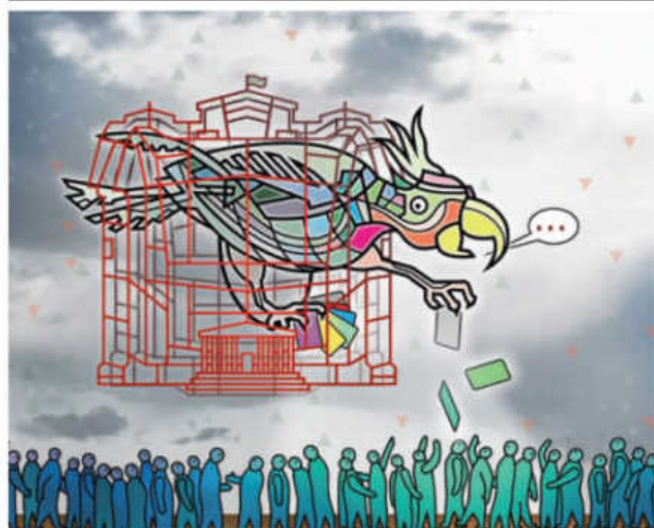
Yields tumbled in anticipation of the ECB's entry. According to Bank of America Merrill Lynch, yields on investment-grade bonds have slid under 1%, their lowest for a year; those on high-yield (junk) bonds have fallen, too.

That suggests the ECB is achieving its objective: directly reducing companies' financing costs. But if it buys less than expected, the rally could go into reverse. And whether cheaper borrowing will spark investment and inflation is questionable: in March, when the ECB unveiled its plan, investment-grade yields were a less-than-prohibitive 1.3%. The ECB is also funnelling cash into banks as fast as it can: another lending-incentive scheme starts this month. But it is lack of demand, not of funds, that is holding Europe back. ■



Free exchange | Sibyl faulty

Central banks have got better at telling markets what they are up to. They must get better still



AT TIMES markets and central banks resemble nothing so much as a quarrelsome couple. They pout at each other. They remonstrate. Above all, they struggle to communicate. Officials at the Federal Reserve and traders in financial markets have been talking past each other for much of the year—most recently in May, when the Fed sought to convince traders that a summer rate rise might be on the cards. The miscommunication is not entirely the fault of the central bank; a shaky world economy makes confident and clear messaging difficult. But that fragility also leaves central banks with less room for error. They should do better.

Not long ago, central bankers thought their job was best done in secrecy. A few reckoned the public could not be trusted to understand the finer points of monetary policy; others felt that catching markets unawares maximised the impact of a change in policy. In the 1980s central bankers rarely saw fit to inform the public of their near-term goals or even about past interventions. When called upon to speak in public, they did so with a practised opacity. Alan Greenspan, chairman of the Fed from 1987 to 2006, was an expert in “mumbling with great incoherence”.

In the 1990s, however, economists came to see transparency as a way to amplify rather than diminish the power of monetary policy. A better understanding of what a central bank is up to, they reasoned, should help investors anticipate its actions, thereby avoiding destabilising lurches in markets. That, in turn, should help central banks keep the economy running smoothly.

As a first step, central banks clarified their policy goals by setting explicit targets for inflation. The Reserve Bank of New Zealand adopted one in 1990—an innovation many have followed. Next central bankers began revealing more about their assumptions and deliberations. A reform of the Bank of England in 1998 required it to explain its decisions, via the publication of minutes of its meetings and a detailed inflation report. In 1999 the Bank of Japan pioneered the tactic of “forward guidance”, when it promised to leave its interest rate at zero “until deflationary concerns subside” (they never did). Clear communication can be extraordinarily powerful. When Mario Draghi, president of the European Central Bank, declared in 2012 that he would do “whatever it takes” to save the euro, market sentiment abruptly reversed.

Unfortunately, central bankers tend to muck up their commu-

nications in three critical ways. First, they often obscure their message with lots of unhelpful noise. More information is better, but only to the extent that it makes future policy actions more predictable. Between meetings, Fed officials barnstorm around the country giving speeches. But their individual assessments of the economy are often a poor guide to the thinking of the monetary-policy committee as a whole.

When the Fed concludes its next meeting on June 15th, it will assault markets with a barrage of information: a statement about economic conditions, a summary of members’ economic projections (including an anonymised “dot plot”, showing where each member thinks interest rates ought to go over the next three years), and a press conference with the chairman, Janet Yellen. But these snippets often conflict: the dots suggest rates will rise steadily in coming years, keeping inflation consistently below 2%, even though Ms Yellen insists that the Fed is just as willing to overshoot its 2% target as undershoot it. This sort of ambiguity reduces both the power and the precision of Fed policy. (Despite that, the Bank of Japan announced a plan in 2015 to adopt many of the Fed’s communication strategies, including the dots.)

In a paper published in 2012, economists at the Federal Reserve Bank of Chicago described a second common flaw with forward guidance that can be even more damaging than cacophony. They distinguish between “Delphic” guidance—economic forecasts—and the “Odyssean” sort—a pledge to behave in a certain way (so named because one example might be promising to resist the siren song of rate increases even if inflation picks up). Some forward guidance could be read either way: the statement that rates are likely to remain low for a long time could mean that the central bank expects growth to be too weak to justify rate rises, in which case investors have good reason to stay pessimistic. But it could also represent a commitment not to raise rates even as growth accelerates, lifting expectations of future inflation and providing an incentive to borrow and invest in the present. A failure to distinguish between the two risks steering markets in the wrong direction.

Not so crystal clear

Now that the Fed has started tightening, it risks making a third mistake: being vague about how many times it intends to raise rates in order to avoid upsetting markets. Recent research by Jeremy Stein (a former Fed governor) and Adi Sunderam, both of Harvard University, suggests that markets see through attempts to serve big rate rises in small doses and begin reacting strongly to small rate shifts (thereby inducing still more caution in central bankers and more market overreaction). That does not mean that central bankers should raise rates steeply in one go, or commit to a particular path for hikes, when they are unsure how the economy as a whole will react. Rather, they should combine guidance about their preferred trajectory for interest rates with a clear statement about what would and would not trigger deviations from that plan.

It is only natural for central banks to be a little tentative in their initial experiments with a relatively new technique such as forward guidance. But in general things would work better if they were more coherent and more forthright. Indeed, the effort to speak more clearly might help monetary-policy committees to think more clearly. ■



Cancer treatment

On target

CHICAGO

The personalisation of cancer treatments is leading to better outcomes for patients. It will also pave the way to cures

“CURE” is not a word much used by oncologists. The best they normally talk of is “remission”. But the past five years have begun to change that. More than 70 new drugs have come to market, and describing the consequences of some of them as revolutionary is not hyperbole—at least for those patients lucky enough to respond positively to them. Being given a diagnosis of advanced melanoma, for example, was once tantamount to being handed a death warrant. Median life expectancy after such news was six to nine months. But recently developed “immuno-oncology” drugs, which co-opt the immune system to fight tumours, are so effective that, in around a fifth of cases, there is talk among experts that the patients involved have actually been cured.

This sort of upbeat news is reinvigorating the study of cancer. At this year’s meeting of the American Society of Clinical Oncology (ASCO), held this week in Chicago, doctors had a spring in their step. Not only do they have new drugs to deploy, they are also developing better ways of using existing ones. They are getting better at diagnosis, too, finding methods to study the weak spots of cancers in parts of the body conventional biopsies cannot reach, and also to pin down tumours that were previously unlocatable. The upshot is that they are beginning to be able to tailor treatments to the needs of individual patients, an approach called personalised medicine.

These days cancer is seen less as a disease of specific organs, and more as one of

molecular mechanisms caused by the mutation of specific genes. The implication of this change of viewpoint is that the best treatment for, say, colorectal cancer may turn out to be something already approved for use against tumours in an entirely different part of the body, such as the breast (pictured above, in a magnetic-resonance-imaging, or MRI, scan; the tumour is in the right-hand breast, from the reader’s point of view). One study presented at ASCO found that 29 of 129 patients responded to drugs that had originally been approved for use on cancers found in parts of the body different from where those patients’ own tumours were. Therapies designed for breast and gastric cancers involving a gene called *HER2* were particularly useful. These *HER2* drugs act on a growth-promoting protein that is overproduced in *HER2*-positive tumours. Seven of 20 patients with colorectal cancer, three of eight with bladder cancer and three of six with bile-duct cancer responded well to these drugs.

Metaphysicians

Another study, a “meta-analysis” of almost 350 early-stage drug trials which gathered the results of these small experiments together in a statistically meaningful way, tried to work out how much benefit there was in matching the molecular characteristics of the tumour of a patient with his treatment. Such matching proved worthwhile. Using it caused tumours to shrink by an average of 31%. Established treatments without such matching resulted in

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an average shrinkage of only 5%.

Work published in the *New England Journal of Medicine*, to coincide with the ASCO meeting, also showed the value of the molecular approach. Elli Papaemmanuil of Memorial Sloan Kettering Cancer Centre in New York, and her colleagues, have produced a molecular classification of acute myeloid leukaemia. They have divided this disease into 11 classes, each with distinct diagnostic features and clinical outcomes, based on which mutated genes seem to be driving the cancer’s development. While this work has not yet led to better treatments, it seems almost bound to in the future.

ASCO itself sees so much value in the personalised, molecular approach to diagnosis and treatment that, despite its being a professional body for doctors rather than a research organisation in its own right, it has decided to run a clinical trial (its first ever) to look at this approach’s potential. TAPUR, as the trial is called, will offer patients a genetic test and then select drugs that look to be good matches, but which are not approved for the specific cancer a patient is suffering from.

The National Cancer Institute, an American government agency, is trying something similar with a trial it calls MATCH. This involves sending tumour biopsies to gene-testing laboratories that then scan them for more than 4,000 possible variants of 143 pertinent genes. Indeed, personalised treatment is becoming so fashionable that even America’s vice-president has got involved. On June 6th Joe Biden announced a project intended to set up a way of sharing genomic and clinical data between cancer researchers, in order to help advance the field.

Taking biopsies such as those that form part of the MATCH trial is a routine part of cancer therapy. It, too, though, is ripe for improvement. Some tissues (blood, lymph and skin, for example) are easy to get at, but ►►

▶ many tumours are deep in the body, or in vital organs, or both. Sampling these is invasive and potentially dangerous. Researchers have therefore wondered for a long time whether something as simple as a blood test might replace such a biopsy. This hope is based on the knowledge that tumours shed pieces of genetic material, known as circulating tumour DNA (ctDNA), into the bloodstream.

Until recently scientific instruments have not been sensitive enough to detect ctDNA routinely and reliably. That is now changing. “Liquid biopsies”, which will not only diagnose hard-to-get-at solid tumours but also monitor the progress of their treatment, are on the verge of reality. At the ASCO meeting researchers sponsored by Guardant Health, a diagnostics company, announced the results of one of the largest liquid-biopsy studies so far.

Liquid asset

This study looked for the ctDNA of six relevant genes in 15,000 patients suffering from one of 50 types of tumour. The test was not perfect. Only 83% of patients had sufficient ctDNA for it to show up. But in those cases where ctDNA was detected the mutations indicated were also present in conventional biopsies between 94% and 100% of the time. The test, in other words, is reliable. Moreover, in almost two-thirds of the cases where ctDNA was detected, the results led to suggestions about how the patients involved should be treated.

If liquid biopsy can be made routine, the clinical consequences will be vast. Conventional biopsies can be both costly and slow to process. Also, the heterogeneity of many tumours, caused by progressive mutation over the course of time, is hard to sample by nipping out one bit of the tumour. If ctDNA is shed by all parts of a tumour, though, a liquid biopsy will be able to capture these differences. It will, as well, be able to follow them as they progress because, unlike conventional biopsy, it can be done frequently without harming the patient. That is important. What constitutes the best treatment can change as the tumour itself changes.

Many researchers therefore feel it is only a matter of time before liquid biopsies become a standard part of therapy. They are already coming to market. Foundation Medicine, of Cambridge, Massachusetts, launched a commercial liquid biopsy in May. Qiagen, a German firm, followed suit on June 1st. Genomic Health, of Redwood City, California, says it will offer a test later this year. And Myriad Genetics, based in Salt Lake City, is also developing such tests.

Such is the excitement over liquid biopsies that some wonder if they might be used to catch cancers even before symptoms are apparent. The earlier a tumour is spotted, the easier it is to cure. The biggest maker of DNA-sequencing machines, Illu-

The international pharmaceutical market

Priced out

CHICAGO

Cancer drugs cost more in America than elsewhere, but that may be just

MANY Americans think they pay over the odds for drugs—particularly for cancer drugs. Some go so far as to suggest that other countries free-ride on their largesse, and that Americans are thus subsidising drug development, a situation which, they say, needs to be fixed by changing trade agreements.

A study unveiled at the American Society of Clinical Oncology’s meeting in Chicago this week looked into the matter. Daniel Goldstein of the Rabin Medical Centre, in Israel, and his colleagues examined the prices of 15 generic and eight patented cancer drugs in six countries (America, Australia, Britain, China, India and South Africa). They found that the highest prices were, indeed, paid by Americans. The median monthly retail price in the United States was \$8,694 for patented drugs like Avastin, Gleevec and

Herceptin, and \$654 for generic drugs like docetaxel and paclitaxel. Of the countries looked at, India paid the least for its patented drugs (\$1,515 a month), and South Africa the least for generics (a tiddly \$120).

The story, though, does not end there. Dr Goldstein went on to look at how the prices of these drugs measured up in terms of affordability. To express this he calculated the monthly price as a percentage of gross domestic product per person at purchasing-power parity (GDPcapPPP).

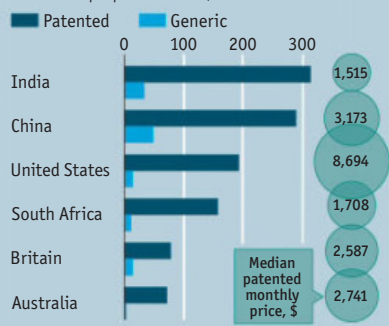
On this measure (see chart), America did middlingly well. India and China were the least able to afford cancer medications. Generic drugs were least affordable in China, where they cost 48% of GDPcapPPP, and patented drugs were least affordable in India, where they were 33%. Americans, by contrast, paid 192% of GDPcapPPP for their patented drugs and a titchy 14% for generics. But Australia, Britain and South Africa all did as well or better than that.

The morals of this story seem twofold. First, just because drugs are cheaper elsewhere does not mean that people who live there can afford to pay for them, let alone pay more than they already do. Were prices higher in China and India, sales might well be lower. Drug companies know that, and set their prices accordingly. Second, it helps to have national purchasing arrangements, as Australia, Britain and South Africa all do. If Americans truly want lower drug prices, they should stop grumbling and become better negotiators, not blame those foreigners who are.

Who pays the piper?

Median monthly drug prices

As % of GDP per person at PPP*, latest available



Source: “Global differences in cancer drug prices”, D Goldstein et al, 2016

*Purchasing-power parity

mina, based in San Diego, has said that it will form an offshoot, Grail, to develop just such a test. The proposed test will use “ultra-deep sequencing”, a technique that reads the DNA in a sample tens of thousands of times over, in order to pick up rare signals such as that from ctDNA.

Yet one of the flaws of ctDNA is that it does not reveal where in the body a cancer is. Some argue that MRI is now sophisticated enough to screen individuals for the presence of most cancers. The Health Nucleus, a firm based in San Diego, is offering full-body scans using it for just this purpose. David Karow, a clinical radiologist who works both there and at the nearby San Diego campus of the University of California, is optimistic about the potential of the technique for wider use. He has been part of a study published in *Clinical Cancer*

Research which suggests that a souped-up form of MRI might become the standard method for prostate-cancer screening. His research indicates that such MRI can differentiate between benign and malignant growths, and can distinguish among the latter between those that just need to be monitored, and the “aggressive” ones that need to be treated.

Personalised cancer treatment, long talked of, is thus now becoming real. By detecting problems earlier and getting therapies right first time, it will save lives that might otherwise be lost. Better knowledge of the underlying processes of cancer, meanwhile, will extend the range of lives that medicine can aspire to save. There is still a long way to go. But gradually and inexorably the appeals court of oncology is tearing up cancer’s death warrants. ■

Carbon capture and storage

Turning air into stone

How to keep waste carbon dioxide in the ground

THIS year the world's power stations, farms, cars and the like will generate the equivalent of nearly 37 billion tonnes of waste carbon dioxide. All of it will be dumped into the atmosphere, where it will trap infra-red radiation and warm the planet. Earth is already about 0.85°C warmer than last century's average temperature. Thanks to the combined influence of greenhouse-gas emissions and El Niño, a heat-releasing oceanic phenomenon, 2016 looks set to be the warmest year on record, and by a long way.

It would be better, then, to find some method of disposing of CO₂. One idea, carbon capture and storage (CCS), involves collecting the gas from power stations and factories and burying it underground where it can do no harm. But CCS is expensive and mostly untried. One worry is whether the buried gas will stay put. Even small fissures in the rocks that confine it could let it leak out over the course of time, undoing much of the benefit. And even if cracks are not there to begin with, the very drilling necessary to bury the gas might create them.

A paper just published in *Science* offers a possible solution. By burying CO₂ in the right sort of rock, a team of alchemists led by Juerg Matter, a geologist at Southampton University, in Britain, was able to transmute it into stone. Specifically, the researchers turned it into carbonate minerals such as calcite and magnesite. Since these minerals are stable, the carbon they contain should stay locked away indefinitely.

Dr Matter's project, called CarbFix, is based in Iceland, a country well-endowed with both environmentalism and basalt. That last, a volcanic rock, is vital to the process, for it is full of elements which will readily react with carbon dioxide. Indeed, this is just what happens in nature. Over geological timescales (ie, millions of years) carbon dioxide is removed from the air by exactly this sort of weathering. Dr Matter's scheme, which has been running since 2009, simply speeds things up.

Between January and March 2012 he and his team worked at the Hellisheidi geothermal power station, near Reykjavik. Despite its green reputation, geothermal energy—which uses hot groundwater to drive steam turbines—is not entirely emissions-free. Underground gases, especially CO₂ and hydrogen sulphide (H₂S), often hitch a ride to the surface, too. The H₂S, a noxious pollutant, must be scrubbed from

the power-station exhaust before it is released, and the researchers worked with remainder, almost pure carbon dioxide.

They collected 175 tonnes of it, mixed it with a mildly radioactive tracker chemical, dissolved the mixture in water and pumped it into a layer of basalt half a kilometre below the surface. They then kept an eye on what was happening via a series of monitoring wells. In the event, it took a bit less than two years for 95% of the injected CO₂ to be mineralised.

They followed this success by burying unscrubbed exhaust gas. After a few teething troubles, that worked too. The H₂S reacted with iron in the basalt to make pyrites, so if exhaust gas were sequestered routinely, scrubbing might not be needed. This was enough to persuade Reykjavik Energy, the power station's owners, to run a larger test that is going on at the moment and is burying nearly 10,000 tonnes of CO₂ and around 7,300 tonnes of H₂S.

Whether CarbFix-like schemes will work at the scale required for fossil-fuel

power stations remains to be seen. In these, the main additional pollutant is sulphur dioxide, which has different chemical characteristics from hydrogen sulphide. Scrubbing may therefore still be needed. Another constraint is the supply of basalt. Though this rock is common, it is found predominantly on the ocean floor. Indeed, geologically speaking, Iceland itself is a piece of ocean floor; it just happens to be above sea level. There are some large basaltic regions on dry land, but they are not necessarily in convenient places.

Nevertheless, if the will were there, pipelines from industrial areas could be built to carry exhaust gases to this basalt. It has not, after all, proved hard to do the reverse—carrying natural gas by pipeline whence it is found to where it is used. It is just a question of devising suitable sticks and carrots to assist the process. How much those sticks and carrots would cost is crucial. But Dr Matter's proof of the principle of chemical sequestration in rock suggests it would be worth finding out. ■

Fixing potholes

The hole story

Researchers are inventing new ways to prevent a motoring curse

POTHOLES are a scourge of rich and poor countries alike. The American Automobile Association recently calculated that 16m drivers in the United States suffered pothole damage to their vehicles in the past five years. That damage ranged from punctures, via bent wheels, to broken suspensions. The bill to fix it was about \$3 billion a year. In India, meanwhile, the cost of potholes is often paid in a harsher currency than dollars. There, more than 3,000

people a year are killed in accidents involving them. Yet cash-strapped governments often ignore the problem, letting roads deteriorate. In Britain, for example, some £12 billion (\$17 billion) would be needed to make all roads pothole-free. Ways of repairing potholes more cheaply and enduringly would thus be welcome. And several groups of researchers are working on it.

The most common cause of potholes is water penetrating cracks in a road's surface ►►



Instant duck pond

▶ and weakening its foundation. This is a particular problem with asphalt surfaces. These are made from an aggregate of materials bound together by sticky bitumen. The constant pounding of traffic disintegrates the road surface above the weakened area. In cold climates the destruction is aggravated by water in the cracks freezing and thawing. The shattered asphalt then peels away, leaving a pothole.

To make matters worse, any repairs that do happen are usually a lash-up. To save money, the material used for the patch is frequently “worked cold”. This means it is not heated with specialist equipment to make the bitumen in it soft enough to flow into the shape required and meld properly with the edges of the pothole. Instead the stuff is simply shovelled off the back of a lorry and pounded down. That can work as a temporary fix until the road can be resurfaced properly, but often as not this job gets delayed almost indefinitely, which results in more cracks appearing around the fill and yet more potholes.

What is needed is a material that can be used as readily as a cold patch, but which works as well as a hot one. Larry Zanko and his colleagues at the University of Minnesota Duluth, think they know what it is. They are mixing asphalt with ground iron ore that contains magnetite—an iron oxide which, as its name suggests, is magnetic. A phenomenon called ferromagnetic resonance means that when magnetite is zapped with microwaves of an appropriate frequency it gets hot.

Dr Zanko and his colleagues built an experimental repair vehicle equipped with a microwave generator on the end of a hydraulic arm. Using this on asphalt that contained between 1% and 2% magnetite, he found he could heat the material in a patch to 100°C in about ten minutes. At that temperature it could be tamped down to produce a more effective repair. The heat also drives out moisture, further improving adhesion, says Dr Zanko. He and his team are now trying to raise the money needed to develop the technology into a commercial pothole-fixing system.

An even better approach, however, would be to stop potholes forming in the first place, by sealing the cracks that cause them before any damage is done. Etienne Jeoffroy of ETH Zurich, a Swiss university, has been attempting to do just that. He also mixes iron oxide into the asphalt, but in this case it does not start off magnetic. Rather, he uses a magnetic field to heat it.

The process he employs is one also used to treat certain tumours. The tumour in question is injected with iron-oxide nanoparticles, which are less than 100 nanometres (billionths of a metre) across. These are then subjected to an alternating magnetic field, which heats them up and cooks the diseased tissue. In his experiments, Dr Jeoffroy found that it takes just a few sec-

Human evolution

Hobbit forming

More on the diminutive ancient inhabitants of Flores

THE folklores of many places speak of “little people”—human-like but not truly human creatures who live on the edge of humanity’s ken. They seemed mere legends, but in 2003 scientists found some (or, rather, their fossil remains) on Flores, an island in Indonesia. These remains, of individuals just over a metre tall, date from 60,000-100,000 years ago. They were called *Homo floresiensis* by their finders and “hobbits” by the press, after the fictional hominids invented by J.R.R. Tolkien. Now, some more, older, fossils have turned up.

The latest discoveries, published in this week’s *Nature* by Gerrit van den Bergh of the University of Wollongong, in Australia, and Yousuke Kaifu of Japan’s National Museum of Nature and Science, go back 700,000 years. Dr van den Bergh and Dr Kaifu have recovered part of a jaw bone (pictured), six isolated adult teeth (five of which are pictured) and two milk

teeth from a second site on Flores. One of the adult teeth, they believe, shows that *Homo floresiensis* descended from *Homo erectus*, a tall species widespread in East and South-East Asia, and not, as some have suggested, from a smaller type, *Homo habilis*, at the moment known only from Africa.

Such scant remains risk overinterpretation. But they do confirm *Homo floresiensis* as a real species (some experts thought the first set of specimens might have been dwarfed by disease rather than by evolution), and one with a long history. That history, indeed, overlapped with the spread out of Africa of *Homo sapiens*, which began about 70,000 years ago, via southern Arabia, and which reached Australia (presumably by way of Flores) around 50,000 years ago. For those proto-Australians, then, tales of the little people in the forests would not have been mere legends.



The memory of bones

onds to heat pieces of nanoparticle-containing bitumen this way. Thus softened, the bitumen seeps into incipient cracks, sealing them up.

Maintenance of roads containing such nanoparticles might therefore require no more than driving over them once a year with a special vehicle which generates an appropriate magnetic field. That would, though, require building roads this way in the first place—or, at least, resurfacing them with nanoparticle-containing asphalt when such maintenance falls due. Stopping potholes growing in existing surfaces, by contrast, means eternal vigilance. And that is what Phil Purnell of the University of Leeds, in Britain, hopes to automate.

As part of a wider project of automating the inspection and maintenance of infrastructure, Dr Purnell and his colleagues are looking at automatic systems which might be fitted to vehicles that ply regular routes, such as buses, to examine roads routinely for signs of damage. In one version of the future such a system would then activate a robotic repair vehicle when it came across a crack that needed fixing. This robot would come to the crack and fill it with a fast-setting bonding material (asphalt would not be needed, since no hole would yet have formed). That is not quite as neat as using nanoparticles and magnetic fields to create a self-healing highway. But if it does the job, who cares? ■



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Palestine

The view on the ground

An elegant and moving account of the trials of the Tamimi family, a tale that is symbolic of the daily lives of many Palestinians

IN THIS book of many stories, few of them happy, it falls to one young Palestinian to get the measure of things. A man puts out a sweet one day, he says. An ant comes to investigate, but finds it too heavy to carry home. So it leaves and returns with many ants; but meanwhile the man takes the sweet away. The ants look around a bit, and finding nothing, file off. The man then replaces the sweet, and the same ant finds it again. It races off to get the others, but before they can return, the man hides it again. Deceived a second time, the ants turn on the first ant and kill it. This is how, in Palestine, hopes can be crushed only so many times before they turn to despair and then rage.

That anger is never far from the surface in “The Way to the Spring”, a new memoir by Ben Ehrenreich, an American writer. It draws on the many months he spent in the occupied West Bank, off and on, from the time of the Arab spring in 2011 to Israel’s bloody incursion into Gaza in 2014. Yet he also calls it a tale of love, and even of hope. Mr Ehrenreich is the author of two well-received novels (“Ether” and “The Suitors”) and he brings a novelist’s eye to his subject, framing the bulk of his book around one village, Nabi Saleh, 30 miles (48km) northwest of Ramallah, the seat of the Palestinian Authority in the West Bank, and around a group of a few dozen protesters,

The Way to the Spring: Life and Death in Palestine. By Ben Ehrenreich. *Penguin Press*; 428 pages; \$28. *To be published in Britain by Granta in August; £14.99*

most of them confusingly from the same extended Tamimi family.

The spring of the title is a real, not a metaphorical Arab spring; a water source used by the Tamimis and others in Nabi Saleh for many decades until, in 1976, the first Israeli settlers arrived and established a community they later called Halamish. Slowly Halamish expanded, as more and more of the land was taken, often for “military needs”, until in 2008 the spring itself was seized.

In 2009 the villagers of Nabi Saleh began what became a long series of marches to their spring; they were opposed by armed settlers, and then by the Israeli army as well, which, the author recounts, fired tear-gas grenades, often directly at the protesters at face or chest height, and rubber-coated bullets. The Tamimis, and Mr Ehrenreich, make a point of always calling them that, not “rubber bullets”. Consisting of a thin layer of rubber around a steel core, a rubber-coated bullet can break a jawbone. It can penetrate the flesh.

The Nabi Saleh marches, of course, achieved nothing. But they generated

some media attention, and they drew activists and observers not just from Israel but from around the world. They have been, as Bassem Tamimi says, “a way to tell the world that we have the right to work our land...the spring is the face of the occupation, the occupation is illegal and we have the right to struggle against it.”

It is in the author’s descriptions of the Tamimis that the hope, and the love, are to be found; the dedication day after day to an effort that yields only failure, sometimes arrest and injury, and even death; and the concern that the Tamimis share for each other, waiting outside detention centres and hospitals for news of a relative.

This is also a cause for rage. As Mr Ehrenreich documents, the clan is divided over tactics. And there are much deeper divisions in Palestinian society as a whole. The government of Mahmoud Abbas, who succeeded Yasser Arafat as leader of the Fatah movement after the latter’s death in 2004, draws the hatred of many Palestinians for dealing with the Israelis, and for accepting that his Palestinian Authority gets to control only a fraction of the West Bank, even if the result is that the politically favoured of Ramallah get jobs and money. “It doesn’t matter if it’s a gold cage or an iron cage,” says Bassem. “It’s a cage.”

And of course, many have it far worse than in Nabi Saleh. There is Sa’adat Sabri, as the book describes, who lives in a house completely fenced in by Israeli security barriers, with a gate he could go in and out of only when the authorities let him. And there is Hebron, the only city in the West Bank where Israelis still live, and where the Palestinian Arabs run a daily gauntlet of checks, searches and barriers.

Many Israelis hate what their government does in the West Bank. But many, too, ►►

condone or support it for reasons ranging from fear of terrorism to mistrust of neighbouring Arab states and the conviction that the land from the river to the sea is theirs by right. They may well hate this book; there is little wider context in it, no attempt to investigate, or even to acknowledge, the other side. (One of the exceptions comes from an Israeli in Hebron, who says that “when someone wants to kill, we’ll kill him first...we’re not the religion that gives the second cheek to anyone.”)

Mr Ehrenreich did not set out to write an objective book; he does not even think it is possible. This is simply a description, detailed and sometimes too much so, of what the facts on the ground look like if you are one of a particular group of Palestinians in the West Bank. It should be read by friends and foes of Israel alike. ■

Literary history

Born to be Wilde

The Fall of the House of Wilde. By Emer O’Sullivan. *Bloomsbury*; 495 pages; £25. To be published in America in October; \$35

AS A child, Oscar Wilde announced that he would like to be remembered as the hero of a “cause célèbre and to go down to posterity as the defendant in such a case as ‘Regina Versus Wilde’”. He succeeded, of course, and his notoriety poses a problem for biographers unlikely to discover anything new about the great aesthete. They increasingly turn to the lesser-canonical figures in his sphere; in 2011 came Franny Moyle’s account of Wilde’s wife, Constance Lloyd. Then “Wilde’s Women” by Eleanor Fitzsimons. Now Emer O’Sullivan, the author of a new book “The Fall of the House of Wilde”, places Oscar in the context of his immediate family, stating that “it is to No.1 Merrion Square we need to look for the formation of Oscar’s mind.”

This approach can reap rewards. Some familial ties are plain to see; Oscar’s renowned style and turn of phrase finds its origins in his mother, Jane; she deplors those who “paraphrase a Poet into the prose of everyday life” and rebukes the subtitle of “Lady Windermere’s Fan” on the grounds that “no one cares for a good woman.” Jane’s salons attracted intellectual figures, with attendants seeking to display their wit and conversational skill. Oscar emulated these events—notably in his drawing-room dramas, where style was paramount—but also in his salons, named “Tea and Beauties”, in London.

The Wildes prized independent thinking. Sir William, a renowned polymath and doctor, controversially advocated in-

terracial coupling, arguing that it encouraged diversity of thought and the progression of society. His wife Jane wrote poems raging with republican spirit, felt passionately about the “bondage of women” and translated a deeply unpopular work on temptation. Oscar inherited this sense of intellectual daring and the need to push boundaries. In one of his first pieces of professional writing, he praises the patent homoeroticism of paintings by Spencer Stanhope. Other reviewers, likely fearful of social condemnation, turned a blind eye.

Yet Ms O’Sullivan often strains to make parallels that aren’t there. Much is made, for example, of Oscar’s affair with Robbie Ross, two years into his marriage with Lloyd. This is the exact time, Ms O’Sullivan notes, at which a patient of William’s called Mary Travers aroused suspicion from Jane. According to Ms O’Sullivan, this may be an echo of the memory or significant “of an order underlying the chaos of human relationships”. That father and son shared a wandering eye does not warrant such sweeping statements.

At the same time, obvious parallels are ignored or suffer from a lack of information. Jane’s lifelong interest in women’s rights and the undervalued intellects of wives surely influenced Oscar’s decision to edit *Woman’s World*, a magazine which provided more varied reading material for an emerging class of educated women. How his family responded to Oscar’s trial and imprisonment—the climax of any biography of the writer—readers can only guess: “what Jane or Willie [Oscar’s brother] thought about Oscar’s pending trial is nowhere recorded.” Similarly, the impact of the trial upon Oscar’s children—who dropped the surname “Wilde” as a result of the scandal—is barely mentioned.



Fine and dandy

Readers may finish the book longing for more detail on Jane Wilde, who is repeatedly lauded as a literary force in her own right (though with little textual support). It is her fate that is the most disquieting. Oscar achieved his aim to be remembered by history—his grave in Paris is a site of pilgrimage. Jane, however, paid the price of his fame. Once voted the greatest living Irishwoman by her contemporaries, Jane Wilde was buried in poverty “without fanfare—without name or record...in soil to which she did not belong”. ■

Alternative medicine

Straight and crooked thinking

It’s All in Your Head: True Stories of Imaginary Illness. By Suzanne O’Sullivan. *Chatto & Windus*; 336 pages; £16.99. To be published in America by Other Press in January

Cure: A Journey into the Science of Mind Over Body. By Jo Marchant. *Crown*; 320 pages; \$26. *Canongate*; £16.99

ABOUT a third of the patients seen by general practitioners in Britain have physical symptoms for which no cause can be found, including unrelenting pain, blindness, seizures and paralysis, according to the Royal College of Psychiatrists. Those who are later told that their suffering is due purely to psychological reasons often react with anger and denial; many refuse to see a psychiatrist; few ever recover.

“It’s All in Your Head”, which won this year’s Wellcome Book Prize, is an illuminating account of psychosomatic disease by Suzanne O’Sullivan, a neurologist. Psychosomatic illness is not fully understood, but stress and traumatic events, such as rape and domestic violence, are suspected to be a cause. That may be why it is more common in women than men. Ms O’Sullivan unravels her patients’ past to explain how memories lodged in the subconscious—from a child’s death to a broken bone—can command debilitating physical illness, in some cases many years later.

Psychosomatic diseases are ubiquitous and cost health systems a fortune (twice the cost of treating diabetes in America in 2002, for example), yet medical textbooks relegate them to footnotes. Patients reject the diagnosis as laden with stigma. Ms O’Sullivan’s book is a plea for change. Huge suffering could be averted if patients, doctors and everyone else stopped viewing them as diseases that are not “real”.

Ms O’Sullivan’s book says almost nothing about what cures exist, mentioning specific treatments such as meditation ►►



only in passing. Where she leaves off, Jo Marchant picks up in “Cure”, a thought-provoking exploration of how the mind can affect the body and can be harnessed to help treat physical illness.

People’s brains are wired to signal pain and exhaustion as a warning to the body when a physical cause exists, but sometimes also when there is none. Altitude sickness, for example, can strike even when blood oxygen is normal, triggered by an expectation of becoming sick. The brain may also be able to control the immune system, causing the body to reject a transplant or to turn on itself (as it does with autoimmune disorders such as Crohn’s disease).

Many patients for whom no other treatments work are helped out of their misery by a placebo—be it a sugar pill or a mock procedure that mimics surgery. Strikingly, that is the case even when they know that a placebo is all they are given. It can provide relief for conditions considered to be purely physical, including chronic, degenerative and terminal ones, as well as some that may be psychosomatic, such as irritable-bowel and chronic-fatigue syndromes. That argues for a change to the current approach, which rejects everything that is “no better than a placebo” as useless.

Ms Marchant talks to sufferers and scientists, and tries out some of the treatments that promise to trick the mind into curative action, including meditation, taking a mail-order placebo for a headache and floating through a virtual-reality ice canyon (which can relieve the excruciating pain suffered by burn victims by distracting them while their wounds are scrubbed). The evidence so far, she cautions, is often from a few small studies. These treatments, if proven to work in more and larger trials, would not help everyone. Some would be effective in combination with existing drugs that tackle the physical symptoms: a placebo can help people with arthritis cope with lower doses of pain medication, for example, and stress-relieving meditation can boost the effect of blood-pressure drugs.

Two things hold back this new field. The first is a pervasive view in medical science that it is all outlandish. A recurring confession from the researchers Ms Marchant meets is that they fear for their academic reputation if they study alternative treatments (one describes the experience as coming “out of the closet”; “Everyone looked at me sort of funny,” says another).

Connected to that, probably, is lack of funding for research. Pharmaceutical companies shun such treatments because they are not moneymakers. Only 0.2% of the \$30 billion annual budget of America’s National Institutes of Health goes toward testing mind-body therapies. Ms Marchant’s book makes a convincing case why that is short-sighted. ■

Emil Zatopek

Feet of fire

Today We Die a Little! The Inimitable Emil Zatopek, the Greatest Olympic Runner of All Time. By Richard Askwith. *Nation*; 457 pages; \$26.99. *Yellow Jersey*; £16.99

FEW athletes are good enough to win an Olympic gold medal. Few people are brave enough to stand up to a tyrannical regime. Emil Zatopek did both. The “Czech Locomotive” was the greatest long-distance runner of his era, and arguably of all time. He won four golds and a silver at the 1948 and 1952 games in London and Helsinki, including the treble of the 5,000 metres, 10,000 metres and marathon at the latter—an achievement that has never been matched. The Helsinki marathon was his first ever race at that distance; he broke the Olympic record by six minutes.

But equally famous were Zatopek’s generosity and courage. In sport, that meant sharing training tips with whoever asked, pushing himself harder than anybody had before, and giving away one of

his medals to an athlete he thought more deserving. Beyond running, he was known for welcoming travellers into his modest home in Prague, and publicly criticising the Russian invasion of Czechoslovakia in 1968 at great personal risk.

This was not, as Richard Askwith reveals in a new biography, “Today We Die a Little!”, the first time that he had resisted. Remarkably, Zatopek threatened to withdraw from the Helsinki games after the Communist Party had prevented the son of a political dissident from competing. Eventually, the party backed down, such was his importance to Czechoslovak propaganda. Mr Askwith says he can think of only one other world-famous athlete who risked the best years of his career by resisting a government: when Muhammad Ali, the great American boxer who died on June 3rd, refused to serve in the Vietnam war (see page 90). Ali was barred from competing; Zatopek was more fortunate.

Strangely, given the myths surrounding Zatopek, his defiance before Helsinki has been largely forgotten. It is one of many illuminating episodes that Mr Askwith has rescued from obscurity, while scrutinising popular tales. Yes, as a factory worker and then a soldier Zatopek used to train in army boots in the snow or on the spot, sprinting up to 32km (20 miles) a day. But probably not, as rumour had it, with his wife Dana, an Olympic javelin champion, on his back. He did indeed work in a uranium mine after his dismissal from the army in 1968. But as a labourer in exile, not a concentration-camp inmate.

Mr Askwith, who has written two other books about running, is best when describing Zatopek on the track: chatting with his rivals in various languages while jostling for the front, scrunching his face and flailing his arms (“like a man wrestling with an octopus”, according to a contemporary sportswriter) while accelerating for the finish. He is thorough, too, with his subject’s political life. Zatopek was not a hardcore dissident. He benefited from his working-class background, believed in communism, fulfilled his propagandist duties and added his name to public letters condemning political prisoners. He recanted his criticism of the regime in 1971 as a broken man, unable to find respectable employment.

Mr Askwith devotes much effort to defending his subject’s concessions to authority. A general willingness to yield to ruthless tyranny does not make Zatopek’s occasional acts of defiance any less courageous, he argues. Yet the author struggles to accept the fallibility of an Olympian hero, ultimately arguing that “it matters little how much of the Emil legend was real”. It is an odd conclusion to an otherwise rigorous account of someone who was not, as some believed, a saint—but, like Muhammad Ali, a great athlete and a good man. ■

Brazil

Rich upon rich

Brazillionaires: The Godfathers of Modern Brazil. By Alex Cuadros. *Spiegel & Grau*; 368 pages; \$28. Profile; £10.99

ONE evening in 2012 Wanderson Pereira dos Santos, a poor, black labourer, was cycling home in Rio de Janeiro. Thor Batista, a rich, white socialite, was driving his SLR McLaren along the same road. Mr Batista says he was driving with due care; Mr Pereira dos Santos is not around to give his version of events. A collision between the two left his body scattered across the highway.

When Alex Cuadros, an American journalist, moved to São Paulo in 2010, Mr Batista's father, Eike, was worth \$27 billion, making him Brazil's richest man. Father and son were staples of Mr Cuadros's job writing about the richest people in South America's largest economy for Bloomberg news agency. His explorations of vast fortunes, and the access his beat gave him to their owners, provided the material for this book.

As the collision on that Rio road illustrates, the lives of billionaires allow Mr Cuadros to explore Brazil's vertiginous social and financial inequality, much of it closely aligned with race. And the story of Mr Batista senior mirrors another aspect of Brazil: its tendency to boom and bust. His fortune rested on oil, mining and logistics companies he set up during the commodity boom; when his oil wells turned out dry and investor sentiment towards Brazil soured, his empire collapsed. By 2015, when Brazil's best lawyers managed to get Thor's conviction for killing Mr Pereira overturned, his father's cars, yachts and planes had been repossessed.

Among the other larger-than-life characters in the book is Paulo Maluf, a former mayor of São Paulo so notorious for corruption that *malufar* has come to mean "to steal from the public purse". Roberto Marinho, a media mogul who died in 2003, helped make and break governments—and shaped popular taste with his television channel's wildly popular *telenovelas*. Edir Macedo, a televangelist, built a vast fortune on donations from the poor adherents of his prosperity gospel. Initially, Mr Cuadros writes, he was not enthusiastic about the billionaires beat. Poor people seemed more interesting. In this excellent book he has managed to use billionaires to illuminate the lives of both rich and poor Brazilians, and all those in between.

Robert Rauschenberg

Ripe for reassessment

A year of Robert Rauschenberg exhibitions begins in Beijing next week

WHEN Robert Rauschenberg's work was shown at the National Art Museum of China in Beijing in 1985, it attracted 300,000 visitors in just 18 days. Young art students travelled from all over the country to marvel at the art of the American master, and its effect was electric. It inspired a generation of avant-garde Chinese artists, who until 1979 had almost never seen Western art, to find their own way to challenge orthodoxy.

One was Song Dong, just 19 and studying oil painting which he quickly abandoned. Now he is known for his performances and his ephemeral—sometimes edible—installations. Another was Huang Yong Ping, now 62 and a French citizen, who set up a group known as the Xiamen Dada, thrilled by the Dadaist provocations he had seen in Rauschenberg's juxtapositions of found objects and imagery. Ai Weiwei, Xu Bing and Cai Guo-Qiang, three of China's best known artists, all cite Rauschenberg as an influence.

Just over 30 years later, Rauschenberg's greatest piece, "The Quarter Mile", also known as "Two-Furlong Piece", a masterpiece made up of 190 parts stretching 305 metres long, will be exhibited in its entirety for the first time. Again, the showcase is in Beijing, this time at the Ullens Centre for Contemporary Art (UCCA). And it will be interesting to see how the work will affect a new generation whose global vision is less restricted than that of its forebears.

Rauschenberg first visited China in 1982 to work with the world's oldest paper mill. "He wanted to make paper of an incredible thickness," explains Philip Tinari, a 37-year-old Mandarin-speaking American who is an expert on 1990s Chinese contem-

porary art and director of UCCA. "He pushed these hidebound artisans to do something radical and new."

He also amassed a huge amount of photography and new ideas during the visit, which found their way into "The Quarter Mile". "He often said it was autobiographical," said David White, who started working with the artist in 1980 and is now a senior curator for the Robert Rauschenberg Foundation. "But it's a series of experiments too." Rauschenberg continued to work on the piece for 17 years, until 1998.

If crossing boundaries across different media is now commonplace, Rauschenberg was there at the start. In 1950s New York, when Abstract Expressionism ruled and the (male) painter was king, he was reimagining the day-to-day, defying the restrictions of canvas and the very tenets of sculpture and painting. Even more than Andy Warhol, it was he who prefigured pop with a famous collage incorporating the face of John Kennedy. From there he went on to work freely in performance with the masters of the avant-garde—Merce Cunningham in dance and John Cage in music—first creating scenery, and then the lighting to do it justice. He forged links between art and science setting up E.A.T. (Experiments in Art and Technology) and delved deeply into lithography, then creating series of works on metal sheets. He worked right up until he died in 2008.

Those unable to get to Beijing in the next two months will still be able to reassess for themselves where Rauschenberg stands in the canon. The first retrospective since the artist's death will open at Tate Modern in December, before travelling to the Museum of Art in New York (MOMA) and later to San Francisco. The show will demonstrate not just the range of Rauschenberg's practice, but also his consistency as an artist. "The youth culture of the 1950s and 1960s, civil rights, Janis Joplin, Reagan and on, this was an artist who continued to respond to the present," says the exhibition's co-curator, Achim Borchardt-Hume. "Younger artists, East and West, are still fascinated by that." ■



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Appointments

Chief Executive Officer London-based



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The Foundation has reached more than 136,000 women in over 90 countries to date. It has built creative, impactful and large scale partnerships with the private sector and works closely with international development actors on entrepreneurship, gender and technology. Since its establishment in 2008, the Foundation has raised over £14 million for women's economic empowerment. The organisation has a strong culture of learning and emphasises the importance of results-oriented partnerships.

The Foundation is seeking a new Chief Executive who will build on its accomplishments, drive change and take the organisation to its next stage of growth. We are seeking a passionate, energetic change leader and people manager who has substantial experience in international development, entrepreneurship, gender and technology. Applicants should demonstrate a thorough commitment to the Cherie Blair Foundation for Women's mission and values of empowerment, inclusiveness and accountability.

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EXPRESSION OF INTEREST



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Invitation to register expression of interest in the Tender Process leading to contract(s) for the provision of Rapid Deployment Seawater Desalination Facilities; both sea-going barge mounted and/or portable land-based plants for the temporary supply of potable water.

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In advance of OPWP releasing the Request for Proposals, OPWP wishes to give notice of the intended process, to allow companies with a proven record in similar projects to submit a formal statement to register their interest with OPWP and to provide details of their experience with the provision and operation of sea-going barges and/or land based portable desalination plants for potable water. The details of experience to be included in the statement are available by requesting it by email from OPWP via (Barge.iwp@omanpwp.com).

Interested parties are encouraged to submit the statement including Expression of Interest in a sealed envelope marked with the project title 'Rapid Deployment Seawater Desalination Facilities' and deposited in the Tender Box at the OPWP Main Office located at Floor 5, Building 5, Muscat Grand Mall, Tital Complex (Office), Al Khuwair Al Janubiyah by **29th June 2016 at 11.00 hrs (Muscat time)**. The EOI should clearly state the contact details of the representative person with email address for the receipt of a notification of release of the tender documents by OPWP.

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IN THE MATTER OF
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AND

IN THE MATTER OF
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TRANSFER OF INSURANCE BUSINESS

NOTICE IS HEREBY GIVEN that, by application issued on 18 May 2016, Guardian Assurance Limited (Guardian) and R&Q Insurance (Malta) Limited (R&Q Malta) applied to the High Court of Justice of England and Wales for, amongst other things, an order under Section 111(1) of the Financial Services & Markets Act 2000 (the Act) sanctioning an insurance business transfer scheme (the Scheme) providing for the transfer of Guardian's general insurance and general inwards reinsurance business to R&Q Malta and for an order making provision under Section 112 of the Act.

The business included in the proposed transfer (the **Transferring Business**) comprises the general insurance and general inwards reinsurance business of Guardian which was written between 1966 and 1995 by AEGON Insurance Company (UK) Limited (formerly known as Ennis Insurance Company (UK) Limited) (AEGON) and which was transferred from AEGON to Guardian pursuant to an insurance business transfer scheme dated 30 September 2002 undertaken pursuant to Schedule 2C of the Insurance Companies Act 1962.

If you are in any doubt as to whether your insurance policy is included in the proposed transfer please contact Guardian Assurance Limited c/o R&Q Insurance Services Limited, at the address and reference set out below.

Copies of a report on the terms of the Scheme prepared by an independent expert in accordance with section 109 of the Act (the **Scheme Report**) and copies of a statement setting out the terms of the Scheme and containing a summary of the Scheme Report may be downloaded from the website www.rqh.com/news/guardian-assurance-part-vii-transfer/. Alternatively, these documents may be obtained, free of charge, by telephoning +44 (0)207 780 5925, or by emailing guardianinsurance@rqh.com, or by writing to Guardian Assurance Limited c/o R&Q Insurance Services Limited at 71 Fenchurch Street, London EC3M 4BS (n/r: Sargeanta Johnson).

Anyone who has questions regarding the proposed transfer or who requires any further information regarding the transfer may also contact Guardian Assurance Limited c/o R&Q Insurance Services Limited at the above telephone number or address.

The application will be heard on 1 September 2016 before a Judge of the Chancery Division of the High Court at 7 Rolls Building, Fetter Lane, London, EC4A 3DF, United Kingdom. Any person who alleges that he or she would be adversely affected by the carrying out of the Scheme is entitled to:

- appear at the hearing and make representations in person;
- instruct a barrister or solicitor advocate to appear at the hearing and make representations on his/her behalf; or
- make representations in writing.

If you intend to appear at the hearing in person, or to instruct a barrister or solicitor advocate to appear on your behalf, you are requested to give notice of your intention to do so in writing, setting out the reasons why you believe you may be adversely affected.

You are requested to send such notices, or if you are not intending to appear in person or by your legal representative, any written representations that you may have, to Guardian Assurance Limited c/o R&Q Insurance Services Limited at the above address or to Wilkie Farr & Gallagher (UK) LLP, CityPoint, 1 Ropemaker Street, London, EC2Y 9AW (Ref: AT/SM/123618.00001) as soon as possible and preferably before 1 August 2016.

If the Scheme is sanctioned by the Court, it will result in the transfer of the Transferring Business from Guardian to R&Q Malta notwithstanding any restriction or right that might otherwise apply in relation to such transfer. Any such restriction or right will only be enforceable to the extent the order of the Court makes provision to that effect. Wilkie Farr & Gallagher (UK) LLP, CityPoint, 1 Ropemaker Street, London, EC2Y 9AW. Solicitors to Guardian and R&Q Insurance (Malta) Limited (Ref: AT/SM/123618.00001).

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The Economist June 11th 2016

Economic data

% change on year ago

	Gross domestic product			Industrial production latest	Consumer prices		Unemployment rate, %	Current-account balance		Budget balance % of GDP 2016 ^f	Interest rates, % 10-year gov't bonds, latest	Currency units, per \$	
	latest	qtr* 2016 ⁱ	2016 ⁱ		latest	2016 ⁱ		latest 12 months, \$bn	% of GDP 2016 ⁱ			Jun 8th	year ago
United States	+2.0 Q1	+0.8	+1.8	-1.1 Apr	+1.1 Apr	+1.4	4.7 May	-484.1 Q4	-2.5	-2.5	1.71	-	-
China	+6.7 Q1	+4.5	+6.6	+6.0 Apr	+2.0 May	+1.9	4.0 Q1 ^s	+293.5 Q1	+2.7	-3.1	2.78 ^{8s}	6.57	6.21
Japan	+0.1 Q1	+1.9	+0.6	-3.5 Apr	-0.3 Apr	nil	3.2 Apr	+157.2 Apr	+3.4	-6.2	-0.13	107	125
Britain	+2.0 Q1	+1.4	+1.8	+1.6 Apr	+0.3 Apr	+0.7	5.1 Feb ^{††}	-146.9 Q4	-4.8	-3.6	1.40	0.69	0.65
Canada	+1.1 Q1	+2.4	+1.5	-0.2 Mar	+1.7 Apr	+1.6	7.1 Apr	-47.6 Q1	-2.7	-1.6	1.20	1.27	1.24
Euro area	+1.7 Q1	+2.2	+1.5	+0.2 Mar	-0.1 May	+0.3	10.2 Apr	+357.1 Mar	+3.0	-1.9	0.06	0.88	0.89
Austria	+1.6 Q1	-0.7	+1.3	+2.5 Mar	+0.5 Apr	+1.1	5.8 Apr	+9.6 Q4	+2.2	-1.9	0.43	0.88	0.89
Belgium	+1.5 Q1	+0.9	+1.3	+1.2 Mar	+2.2 May	+1.5	8.7 Apr	-0.1 Dec	+1.2	-2.4	0.45	0.88	0.89
France	+1.4 Q1	+2.6	+1.4	-0.8 Mar	-0.1 May	+0.2	9.9 Apr	-21.9 Apr ^f	-0.5	-3.5	0.42	0.88	0.89
Germany	+1.6 Q1	+2.7	+1.6	+1.2 Apr	+0.1 May	+0.4	6.1 May	+292.3 Mar	+8.0	+0.4	0.06	0.88	0.89
Greece	-1.3 Q1	-1.9	+1.2	-4.0 Mar	-1.3 Apr	+0.5	24.2 Feb	+1.1 Mar	+2.1	-3.9	7.41	0.88	0.89
Italy	+1.0 Q1	+1.0	+1.0	+0.5 Mar	-0.3 May	+0.2	11.7 Apr	+41.4 Mar	+1.9	-2.5	1.31	0.88	0.89
Netherlands	+1.4 Q1	+1.9	+1.7	+0.3 Mar	nil Apr	+0.5	7.8 Apr	+68.8 Q4	+9.7	-1.6	0.28	0.88	0.89
Spain	+3.4 Q1	+3.1	+2.8	+8.9 Apr	-0.9 May	-0.4	20.1 Apr	+17.1 Mar	+1.2	-3.5	1.46	0.88	0.89
Czech Republic	+2.6 Q1	+1.4	+2.7	+4.2 Apr	+0.6 Apr	+1.3	5.4 May ⁸	+1.5 Q4	-0.1	-1.5	0.51	23.7	24.5
Denmark	+0.1 Q1	+2.2	+1.2	+2.0 Apr	nil Apr	+0.7	4.3 Apr	+18.8 Mar	+6.0	-2.8	0.35	6.53	6.66
Norway	+0.7 Q1	+4.0	+1.5	+6.0 Apr	+3.2 Apr	+2.5	4.7 Mar ^{††}	+29.3 Q1	+11.2	+6.8	1.29	8.11	7.90
Poland	+2.5 Q1	-0.4	+3.5	+6.0 Apr	-1.0 May	+1.2	9.2 May ⁸	-2.0 Mar	-1.9	-2.1	3.10	3.79	3.72
Russia	-1.2 Q1	na	-0.9	+0.6 Apr	+7.3 May	+7.5	5.9 Apr ⁸	+51.3 Q1	+3.3	-2.5	8.74	63.8	56.2
Sweden	+4.2 Q1	+2.0	+3.5	+3.5 Apr	+0.8 Apr	+1.0	7.3 Apr ⁸	+28.2 Q1	+5.6	-0.5	0.62	8.11	8.36
Switzerland	+0.7 Q1	+0.4	+1.2	+1.0 Q1	-0.4 May	-0.6	3.5 Apr	+75.9 Q4	+9.6	+0.3	-0.38	0.96	0.94
Turkey	+5.7 Q4	na	+3.3	+0.6 Apr	+6.6 May	+7.7	10.9 Feb ⁸	-29.5 Mar	-4.6	-1.8	9.54	2.88	2.77
Australia	+3.1 Q1	+4.3	+2.6	+4.8 Q1	+1.3 Q1	+1.6	5.7 Apr	-62.3 Q1	-4.0	-2.0	2.19	1.34	1.31
Hong Kong	+0.8 Q1	-1.8	+2.0	-1.3 Q4	+2.7 Apr	+2.6	3.4 Apr ^{††}	+9.6 Q4	+2.7	-0.4	1.20	7.76	7.75
India	+7.9 Q1	+9.6	+7.5	+0.1 Mar	+5.4 Apr	+5.1	4.9 2013	-22.6 Q4	-1.1	-3.7	7.49	66.7	64.1
Indonesia	+4.9 Q1	na	+5.1	+3.4 Mar	+3.3 May	+4.3	5.5 Q1 ⁸	-18.2 Q1	-2.4	-1.9	7.52	13,265	13,380
Malaysia	+4.2 Q1	na	+5.5	+2.8 Mar	+2.1 Apr	+2.8	3.5 Mar ⁸	+7.0 Q1	+2.6	-3.7	3.88	4.06	3.77
Pakistan	+5.5 2015**	na	+4.8	+6.7 Mar	+3.2 May	+5.1	5.9 2015	-2.4 Q1	-0.9	-4.6	8.03 ^{†††}	104	102
Philippines	+6.9 Q1	+4.5	+6.2	+7.8 Mar	+1.6 May	+2.6	6.1 Q2 ⁸	+8.4 Dec	+3.5	-1.9	4.44	46.0	45.0
Singapore	+1.8 Q1	+0.2	+2.5	+2.9 Apr	-0.5 Apr	+1.1	1.9 Q1	+54.8 Q1	+20.6	+0.9	2.05	1.35	1.36
South Korea	+2.8 Q1	+2.1	+2.6	-2.8 Apr	+0.8 May	+1.3	3.9 Apr ⁸	+103.1 Apr	+7.0	+0.4	1.70	1,157	1,123
Taiwan	-0.7 Q1	+3.1	+2.1	-4.1 Apr	+1.2 May	+1.0	4.0 Apr	+74.8 Q1	+12.4	-0.9	0.79	32.2	31.1
Thailand	+3.2 Q1	+3.8	+3.5	+1.5 Apr	+0.5 May	+2.4	1.0 Apr ⁸	+39.6 Q1	+3.0	-2.2	2.16	35.2	33.8
Argentina	+2.3 Q2	+2.0	-0.7	-2.5 Oct	— ***	—	5.9 Q3 ⁸	-15.9 Q4	-2.6	-2.8	na	13.9	9.02
Brazil	-5.4 Q1	-1.1	-3.7	-7.2 Apr	+9.3 May	+8.3	11.2 Apr ⁸	-34.1 Apr	-1.4	-5.7	12.41	3.40	3.13
Chile	+2.0 Q1	+5.3	+3.1	-3.4 Apr	+4.2 May	+3.6	6.4 Apr ^{8††}	-4.7 Q1	-1.4	-1.8	4.55	673	635
Colombia	+2.5 Q1	+0.6	+3.3	+1.3 Mar	+8.2 May	+4.4	9.0 Apr ⁸	-18.9 Q4	-5.2	-1.9	7.92	2,903	2,618
Mexico	+2.6 Q1	+3.3	+2.3	-2.0 Mar	+2.5 Apr	+3.0	3.9 Apr	-30.5 Q1	-2.9	-3.0	6.07	18.2	15.7
Venezuela	-8.8 Q4~	+8.4	-7.0	na	na	+181	7.3 Apr ⁸	-17.8 Q3~	-1.5	-14.4	11.17	9.99	6.30
Egypt	+4.0 Q4	na	+3.8	-10.9 Mar	+10.3 Apr	+9.8	12.7 Q1 ⁸	-16.8 Q4	-2.7	-9.8	na	8.88	7.63
Israel	+1.7 Q1	+0.8	+3.5	-0.5 Mar	-0.9 Apr	+1.2	4.9 Apr	+13.8 Q4	+4.2	-2.5	1.71	3.83	3.84
Saudi Arabia	+3.5 2015	na	+2.8	na	+4.2 Apr	+3.8	5.7 2014	-53.5 Q4	-1.8	-9.3	na	3.75	3.75
South Africa	-0.2 Q1	-1.2	+0.7	-1.5 Mar	+6.2 Apr	+6.4	26.7 Q1 ⁸	-13.6 Q4	-4.2	-3.3	9.05	14.7	12.6

Source: Haver Analytics. **% change on previous quarter, annual rate. [†]The Economist poll or Economist Intelligence Unit estimate/forecast. ⁸Not seasonally adjusted. ^fNew series. ~2014 **Year ending June. ^{††}Latest 3 months. ^{†††}3-month moving average. ^{8s}5-year yield. ***Official number not yet proved to be reliable; The State Street PriceStats Inflation Index, March 34.88%; year ago 27.1% ^{††††}Dollar-denominated bonds.

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Markets

	Index Jun 8th	% change on		
		one week	Dec 31st 2015	
			in local currency	in \$ terms
United States (DJIA)	18,005.1	+1.2	+3.3	+3.3
China (SSEA)	3,063.8	+0.5	-17.3	-18.3
Japan (Nikkei 225)	16,830.9	-0.7	-11.6	-0.3
Britain (FTSE 100)	6,301.5	+1.8	+0.9	-0.3
Canada (S&P/TSX)	14,313.1	+1.8	+10.0	+20.5
Euro area (FTSE Euro 100)	1,023.4	-0.4	-6.5	-1.9
Euro area (EURO STOXX 50)	3,019.8	-0.6	-7.6	-3.1
Austria (ATX)	2,245.2	+1.0	-6.3	-1.8
Belgium (Bel 20)	3,543.5	+1.1	-4.2	+0.4
France (CAC 40)	4,448.7	-0.6	-4.1	+0.6
Germany (DAX)*	10,217.0	+0.1	-4.9	-0.3
Greece (Athex Comp)	652.4	+1.1	+3.3	+8.4
Italy (FTSE/MIB)	17,909.7	+0.6	-16.4	-12.3
Netherlands (AEX)	450.2	+0.8	+1.9	+6.9
Spain (Madrid SE)	889.7	-1.0	-7.8	-3.3
Czech Republic (PX)	874.1	-1.6	-8.6	-4.1
Denmark (OMXC20)	889.4	-0.8	-1.9	+3.3
Hungary (BUX)	27,396.9	+1.5	+14.5	+22.2
Norway (OSEAX)	681.4	+2.4	+5.0	+14.6
Poland (WIG)	46,551.5	+4.1	+0.2	+4.3
Russia (RTS, \$ terms)	965.4	+8.4	+11.5	+27.5
Sweden (OMXS30)	1,361.5	+0.3	-5.9	-2.2
Switzerland (SMI)	8,143.8	-0.5	-7.6	-3.7
Turkey (BIST)	78,832.6	+2.3	+9.9	+11.2
Australia (All Ord.)	5,441.1	+0.9	+1.8	+4.3
Hong Kong (Hang Seng)	21,297.9	+2.6	-2.8	-3.0
India (BSE)	27,020.7	+1.1	+3.5	+2.7
Indonesia (JSX)	4,916.1	+1.6	+7.0	+11.2
Malaysia (KLSE)	1,657.9	+1.9	-2.0	+3.5
Pakistan (KSE)	37,426.4	+2.5	+14.0	+14.3
Singapore (STI)	2,862.4	+2.6	-0.7	+4.6
South Korea (KOSPI)	2,027.1	+2.2	+3.4	+4.8
Taiwan (TWI)	8,715.5	+1.4	+4.5	+6.7
Thailand (SET)	1,445.5	+2.1	+12.2	+14.6
Argentina (MERV)	13,624.9	+7.9	+16.7	+9.0
Brazil (BVSP)	51,629.3	+5.3	+19.1	+38.7
Chile (IGPA)	19,806.0	+2.3	+9.1	+14.8
Colombia (IGBC)	9,964.4	+3.1	+16.6	+27.5
Mexico (IPC)	46,263.8	+1.6	+7.6	+2.3
Venezuela (IBC)	15,466.2	-0.6	+6.0	na
Egypt (Case 30)	7,780.1	+2.7	+11.0	-2.1
Israel (TA-100)	1,251.8	nil	-4.8	-3.3
Saudi Arabia (Tadawul)	6,605.0	+2.3	-4.4	-4.3
South Africa (JSE AS)	53,960.2	+0.8	+6.4	+12.1

The Economist poll of forecasters, June averages (previous month's, if changed)

	Real GDP, % change				Consumer prices		Current account	
	Low/high range		average		% change		% of GDP	
	2016	2017	2016	2017	2016	2017	2016	2017
Australia	1.9/3.0	2.1/3.5	2.6 (2.5)	2.8	1.6 (1.7)	2.3 (2.4)	-4.0 (-4.1)	-3.4 (-3.5)
Brazil	-4.2/-3.1	-0.8/2.0	-3.7	0.8 (0.6)	8.3	6.0 (6.5)	-1.4 (-1.6)	-1.2 (-1.3)
Britain	1.5/2.1	1.5/2.6	1.8 (1.9)	2.0 (2.1)	0.7 (0.6)	1.7 (1.8)	-4.8 (-4.7)	-4.1 (-4.2)
Canada	1.0/2.0	1.2/2.6	1.5 (1.6)	2.0	1.6 (1.5)	2.0 (1.9)	-2.7 (-2.8)	-2.4 (-2.3)
China	6.3/6.9	5.8/6.7	6.6 (6.5)	6.3 (5.9)	1.9 (1.8)	1.9 (1.7)	2.7 (2.8)	2.6
France	1.1/1.8	1.2/1.9	1.4 (1.3)	1.5 (1.4)	0.2	1.2 (1.1)	-0.5 (-0.3)	-0.5
Germany	1.4/2.0	1.2/2.3	1.6 (1.5)	1.6	0.4 (0.3)	1.5	8.0 (7.6)	7.6 (7.2)
India	6.1/8.5	6.1/8.3	7.5	7.5 (7.1)	5.1 (5.2)	5.1 (4.8)	-1.1 (-1.0)	-1.4 (-1.3)
Italy	0.7/1.2	0.7/1.7	1.0	1.2	0.2	1.2 (1.1)	1.9	1.8 (1.7)
Japan	0.2/0.8	0.1/1.9	0.6 (0.5)	0.8 (0.6)	nil (0.2)	1.2 (1.6)	3.4 (3.8)	3.2 (3.3)
Russia	-2.7/0.5	-0.7/3.0	-0.9 (-1.3)	1.3 (1.2)	7.5 (8.2)	6.1 (6.4)	3.3 (3.7)	3.4 (4.1)
Spain	2.5/3.1	1.7/2.9	2.8	2.2 (2.3)	-0.4 (-0.5)	1.2	1.2 (1.0)	1.0 (0.9)
United States	1.0/2.3	1.3/2.9	1.8	2.1	1.4 (1.2)	2.2	-2.5 (-2.7)	-2.8
Euro area	1.3/1.8	1.3/2.1	1.5	1.6	0.3 (0.2)	1.4 (1.3)	3.0 (2.8)	2.8 (2.5)

Sources: Bank of America, Barclays, BNP Paribas, Citigroup, Commerzbank, Credit Suisse, Decision Economics, Deutsche Bank, EIU, Goldman Sachs, HSBC Securities, ING, Itau BBA, JPMorgan, Morgan Stanley, Nomura, RBS, Royal Bank of Canada, Schroders, Scotiabank, Société Générale, Standard Chartered, UBS. For more countries, go to: Economist.com/markets

Other markets

	Index Jun 8th	% change on		
		one week	Dec 31st 2015	
			in local currency	in \$ terms
United States (S&P 500)	2,119.1	+0.9	+3.7	+3.7
United States (NAScomp)	4,974.6	+0.5	-0.7	-0.7
China (SSEB, \$ terms)	351.5	+0.8	-16.6	-17.6
Japan (Topix)	1,351.0	-0.8	-12.7	-1.5
Europe (FTSEurofirst 300)	1,352.9	+0.2	-5.9	-1.3
World, dev'd (MSCI)	1,694.3	+1.3	+1.9	+1.9
Emerging markets (MSCI)	835.9	+3.6	+5.3	+5.3
World, all (MSCI)	408.3	+1.5	+2.2	+2.2
World bonds (Citigroup)	949.1	+1.8	+9.1	+9.1
EMBI+ (JPMorgan)	771.3	+1.8	+9.5	+9.5
Hedge funds (HFRX)	1,167.5 [§]	+0.4	-0.6	-0.6
Volatility, US (VIX)	14.1	+14.2	+18.2 (levels)	
CDSs, Eur (iTRAXX) [†]	73.2	-1.5	-5.1	-0.4
CDSs, N Am (CDX) [†]	73.8	-4.7	-16.5	-16.5
Carbon trading (EU ETS) €	6.1	+2.3	-26.3	-22.7

Sources: Markit; Thomson Reuters. [†]Total return index.

[‡]Credit-default-swap spreads, basis points. [§]June 6th.

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

The Economist commodity-price index

2005=100

			% change on	
	May 31st	Jun 7th*	one month	one year
Dollar Index				
All Items	137.3	140.9	+3.6	-1.8
Food	164.4	171.2	+6.4	+7.1
Industrials				
All	109.1	109.5	-0.5	-13.5
Nfa [†]	117.9	119.6	-0.6	-5.6
Metals	105.4	105.2	-0.5	-16.9
Sterling Index				
All items	171.6	176.1	+3.0	+3.3
Euro Index				
All items	153.3	154.3	+4.0	-2.8
Gold				
\$ per oz	1,214.3	1,241.4	-1.6	+5.5
West Texas Intermediate				
\$ per barrel	48.9	50.5	+12.9	-15.8

Sources: Bloomberg; CME Group; Cotlook; Darmann & Curl; FT; ICCO; ICO; ISO; Live Rice Index; LME; NZ Wool Services; Thompson Lloyd & Ewart; Thomson Reuters; Urner Barry; WSJ. [†]Provisional

[‡]Non-food agricultural.

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The greatest

Muhammad Ali, heavyweight boxer, died on June 3rd, aged 74

PURE skill was much of it. The brutal delicacy of the ring-craft, so rare in the heavyweight division. Among the lumbering sloggers he dodged and danced, floating like a butterfly, stinging like a bee. Faced with a solid, flat-footed opponent, as all seemed to be compared with him, he would circle, torment and mesmerise, throwing short punches at speed. All that weaving, skipping, leaning leisurely away, before coming in for the kill. Flooring Sonny Liston once with a punch so fast that no one quite saw it (see above). Taunting George Foreman to exhaustion by sinking into the slack ropes, just letting him punch himself out while his own fine, hard body absorbed the blows. He always knew when his rivals would topple. He would mimic their shuffling desperation and his own artistry, pummelling the air with fast, precise, furious fists. Let the old guard complain that he ducked and dipped too much, held his hands too low and his chin cocked too high; he won fights.

And what fights. Fifty-six of them in his career, and only five defeats. One against Liston in 1964, when he was 22 and the odds were 7-1 against him, that left the world heavyweight champion too beat up after six rounds to come out of his corner.

One against Cleveland Williams that was watched by the biggest indoor crowd yet seen in boxing, 35,460 people. The Rumble in the Jungle in Kinshasa in 1974, at which 60,000 Congolese cried “Ali, boumayé! Ali, kill him!” The Thrilla in Manila against Joe Frazier the next year, fought in 100-degree heat, to retain his title when he was 33 years old. Boxing had never been so entertaining or so global. In the whole bruised and bloody history of the sport, there had never been such a star.

He was handsome, and knew it. “Ain’t I pretty?” he would pout and shout, daring anyone to think him effeminate also. Perfect musculature, long legs, regular features and not a mark on his face, just to prove how agile he was. Most heavyweights, black or white, wore their damage as a ruined mask. His looks lasted for most of his career, though as he got older and slower the beauty thickened.

And in the face, that motor-mouth. His comic bragging made him the darling of sports reporters, irresistible copy. How did he train? Why, he handcuffed lightning, threw thunder in jail, murdered a rock, wrestled alligators, tussled with a whale. How would he despatch his opponents? Launch them into space like human satel-

lites, pound them flat to hearthrugs, hit them so hard they’d wonder where October and November went. And what about him? He was king of all kings, young, brash, full of dash, shaker-up of the world, the greatest! No ring could contain him.

But this was not his chief importance. In one person, he displayed every aspect of the struggles of blacks in mid-20th century America. Because he was a star but not a saint, as Martin Luther King was, he drew attention to their cause as no one else could: the frustrations of it, the temptations, the contradictions and the wrong turnings. In the end there came a kind of calm, when his gloves were hung up in the office of the first black president. How long a slog and punishment it had taken to get there.

A black God

Start with his childhood, in the separate worlds of the segregated South. That nice middle-class home on Grand Avenue which counted for nothing, because in Louisville, Kentucky black middle-class was nothing like white. His mother’s lowly job, cleaning bathrooms for white folks. The different water fountains and lunch counters, the seats at the back of the bus, the sense of being a dog to be kicked around. When he learned to box at 12—skinny in satin trunks, his defensive pose already good—it was mostly to whip the thief who had stolen his brand-new bike, and also because it seemed the fastest way, almost the only way, for a black youth to make it in America.

Yet boxing, of all sports, still carried the stain of slavery on it: of the days when a whole crowd of white plantation-owners would sit around watching their two strongest slaves grapple and bloody each other. (His own first promoters in Louisville were all white men, several of them racehorse-breeders. They assessed him like blood-stock.) The black champions who emerged were meant to be noble, patient, heroic specimens of their race, making no trouble and playing no part in any political controversy. An uppity, lippy black like him, jabbering from six months old and always the orator at the centre of a crowd of boys, became an instant threat both to white men and, worse, white women.

But he wasn’t likely to keep quiet about that. Denied entry to diners on a southern tour, he made one of his raps of it: “Man, it was really a letdown drag. For all those miles I had to eat out of a bag.” Told in a Louisville hamburger joint, when he went in wearing his Olympic gold medal, that they still didn’t serve niggers, he said that was fine; he didn’t eat them. But under the joshing lay depth upon depth of furious resentment. Fury that made him throw that gold medal into the Ohio river, because it had earned him no more respect from ▶▶

▶ whites than he had had before. Fury that made him shout, at the peak of his career, that he was the part of America whites refused to recognise: "But get used to me: black, confident, cocky; my name, not yours; my religion, not yours; my goals, my own. *Get used to me.*"

Anger, defiance and pride, all rolled up, led him to convert to the Nation of Islam. As a teenager, already the greatest that ever lived, barely literate but fanatically building up his lean, muscled body with raw-egg milkshakes and exercise, he couldn't resist the teaching that man was originally created black, by a black God, and that blacks were the finest people on Earth. As time went on, he also agreed with Malcolm X that non-violent protest would get blacks nowhere. It took a coward to sit but it took a man to stand, as when, battered almost to death, a boxer came out of his corner. Violence called for violence, jab to jab, punch to punch; segregation demanded counter-segregation. Blacks and whites had no business marrying or living together. For a decade he railed against immorality like a true-dyed Muslim fanatic, though many, seeing him disappear into the tour van with yet another girl, wondered how deep it really went.

His brand-new identity was the vital thing. By casting off his "slave name" of Cassius Clay, something he had never chosen and never wanted, he became a new sort of black man, his proper self: Muhammad Ali, "worthy of all praise, most high". When the press ignored it, thinking it a stunt, he was incensed. If boxing rivals called him "Cassius" or "Clay" he would beat them within an inch of their lives, crying "What's my name?" "What's my name?" Black heavyweights who were not new men like him, still managed by white mobsters and dutifully silent about politics, he called Uncle Toms and "great white hopes" and mimicked their grunts and shuffles, *ouf, ouf, ouf*, like bears or apes. It became a habit, turned most viciously against Frazier and Foreman, funny and appalling both at once.

In his own incarnation the threatening black fighter became a different being. He was tall, lithe, graceful, effortlessly eloquent—but also perilously loud, defiant, empowered. He was just as dangerous. Older boxers like Joe Louis, his closest rival for title of "best-ever", wanted to be champions of all Americans, smothering their black frustrations to make everyone accept them. He was the undefeatable champion of his people, 30m oppressed blacks, and he was smothering nothing.

This was the spirit in which he refused in 1967 to be drafted for the Vietnam war. Why should he go 10,000 miles to shoot "some darker people", some poor hungry folk in the mud who wanted only their own freedom, their own justice? He had no quarrel with the Vietcong; they had never

called him nigger, or lynched him, or put the dogs on him: "The real enemy of my people is here." His punishment for saying so, the loss of his title and three and a half years out of boxing at his peak, was crushing, but he accepted it calmly, as the sort of thing a fresh Negro had always had to accept for speaking out, for 400 years; and went on saying the same thing in mosques and on college campuses, wherever they would listen to him. Barely able to read, he had to memorise everything he wanted to say, but it was in his mouth already: some peace-talk, some race-talk, and a lot about himself as the greatest fighter in the world.

Carrying the torch

There was no way out of this self-imposed exile, this sharp turn towards confrontation and even segregation, unless America changed. As it gradually happened, with war-weariness spreading and racial injustice eroding, so he changed too. He slowed as a fighter: allowed back in the ring in 1970, his status as a conscientious objector now established, his reflexes were duller and his body forced to absorb blows he could have evaded in his prime; Frazier's defeat of him over 15 rounds the next year was the worst battering of his life. He wasn't going to cry. Instead, it was America's turn to regret the fights that might have been, the encounters that—to listen to him—would send his rivals flying out of the ring until even radar couldn't track them.

His radicalism, too, grew softer, until in 1975 he abandoned the Nation of Islam for the more orthodox, peaceful sort. Kindness, friendship and peace were his mantras now, with complimentary poems written even to the boxers he had scorned. More amenable, even extravagantly embraced, he could be invited to the White House, offered missions to Africa and asked in 1996 to carry the Olympic torch to open the games in Atlanta before a global audience of perhaps 3 billion people, the

image of all black men being celebrated and respected in one man, whom the world adored. When the games ended he was given a gold medal, to replace the one he had thrown in the Ohio river.

Yet change was also forced upon him. In Atlanta his hand shook as he lit the flame and his mouth trembled as he repeatedly kissed the medal, the unavoidable signs of Parkinson's disease. Its rigid, numbing cloak was his vesture for 30 years. Like so many before him, he had gone on fighting long after he should have hung up his gloves. He had taken too many hard punches to that handsome, taunting head. His doctor told him to stop, but he ignored him. By the late 1970s, the days when he had to book 50 hotel rooms for his away matches were over. The hangers-on had slunk away, though not before he had given them, as well as Black Muslim charities, much of his fortune. By the mid-1990s, when he was signing boxing memorabilia for money, his wife had to spell out the letters for him one by one. He said simply: "I sign my name, we eat."

In old age, though, he was neither mad nor broke, as some boxers were. He was placid, serene and, in the face of his relentless illness, brave. That, too, became an image of the centuries-long endurance of blacks and their spiritual patience. He spent much of his time in contemplation, rising at dawn and kneeling to face Mecca to pray so long as his body was up to it. Conquering the world, as he had done time after time with pure punching skill, did not now seem the source of true happiness. Nonetheless, he still loved to watch film of his old bouts—"Sooh fast! Sooh pretty!"—and think what they had done for the self-esteem of his people. And his words, being now so few rather than so many, carried all the more conviction. He hoped to be remembered "as a man who never looked down on those who looked up to him." ■





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