

The Economist

MAGA's AI split

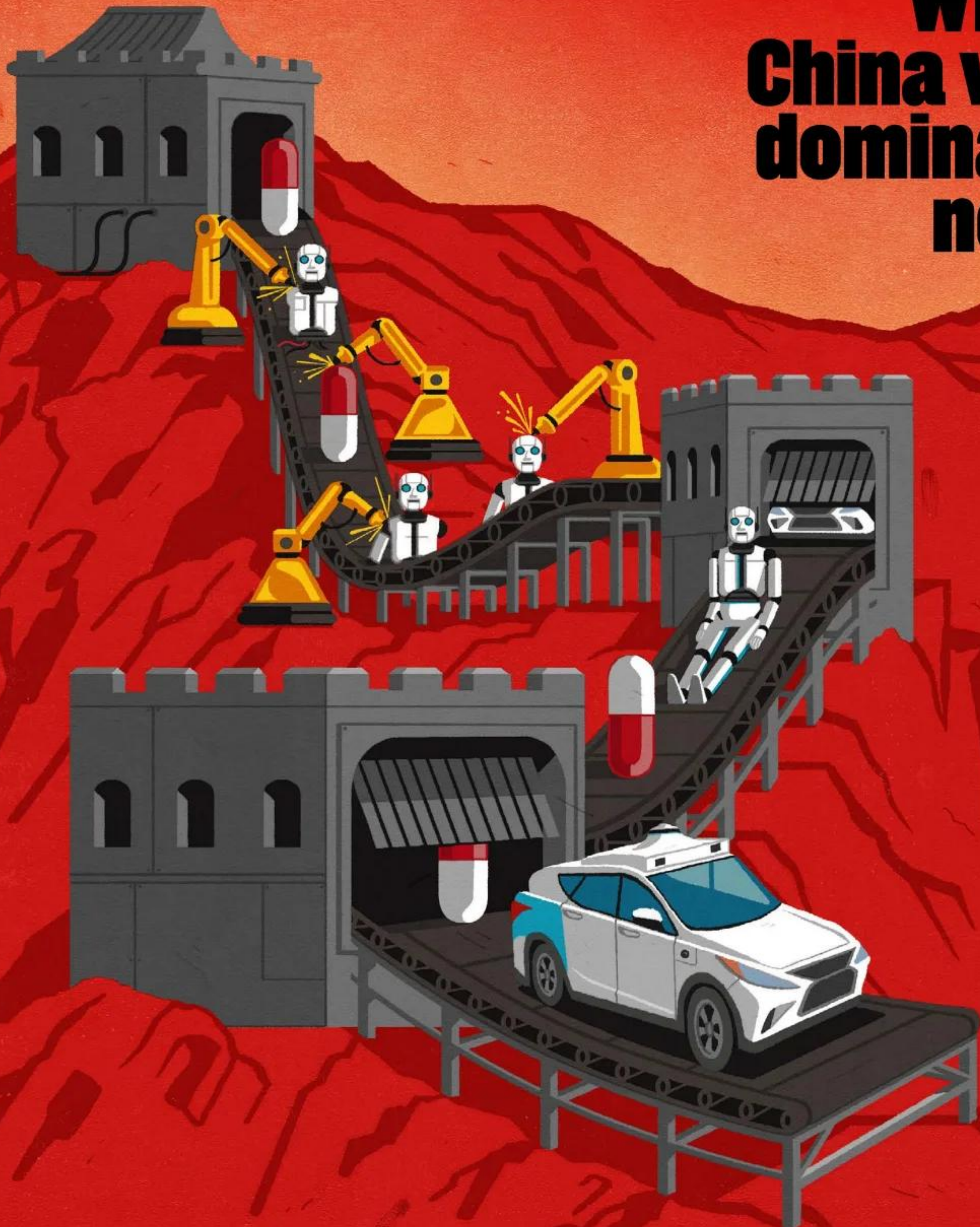
Ukraine: ambush averted?

A dispatch from Iran

Rethinking cholesterol

NOVEMBER 29TH–DECEMBER 5TH 2025

What China will dominate next





150
YEARS

AUDEMARS PIGUET
Le Brassus



CODE 11.59 BY AUDEMARS PIGUET

FOR OVER 75 YEARS WE'VE DONE EVERYTHING WRONG.

They said an engine belongs in the front.
We put it in the rear.

They said ignition's on the right.
We installed it on the left.

They said we'd ruin everything if we gave up air-cooled engines.
We replied that progress doesn't ask for permission.

They said a real Porsche has no more than two doors.
We built four-door models. And made them faster than most two-door ones.

They said a sports car can never be electric.
We developed the Taycan.

They said we couldn't keep improving the 911.
We've been doing exactly that for over 60 years.

They said we're stubborn. That might be true.
Because we're too busy moving forward.
Always doing the things they say can't be done.

Porsche. There is no substitute.



PORSCHE

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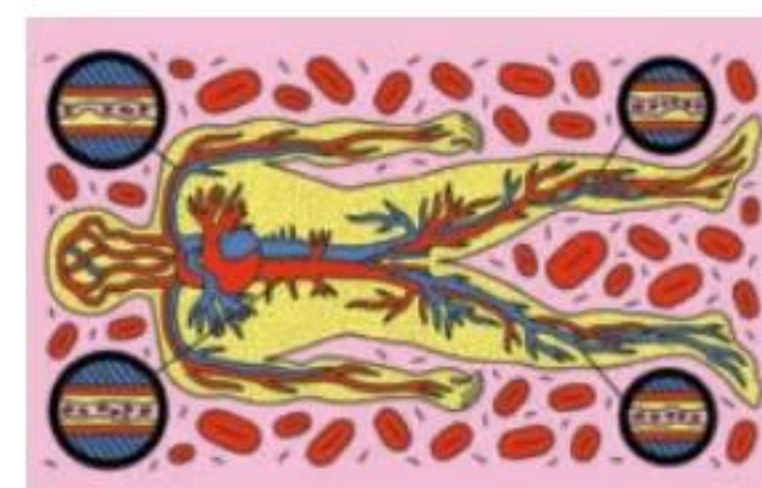
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to take part in "a severe contest between intelligence, which presses forward, and an unworthy, timid ignorance obstructing our progress."

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The world this week Politics



President Donald Trump said that “tremendous progress” had been made in negotiations between **Ukraine** and **Russia**. A controversial 28-point peace proposal drafted with Russia was revised during a meeting between American, Ukrainian and European officials in Geneva. Ukraine’s president, Volodymyr Zelensky, said he was ready to discuss “sensitive” issues, which include territorial concessions and his country reducing its armed forces.

A judge in Georgia dismissed the **racketeering case against Mr Trump** and others, ending the criminal jeopardy of the president for allegedly trying to overturn the 2020 election. Three other criminal cases against Mr Trump have been dismissed or put aside since he was returned to office.

Mr Trump called the **shooting** of two National Guard members near the White House in Washington an “act of terror”. The guardsmen were in critical condition. The suspected attacker, 29-year-old Rahmanullah Lakanwal, is believed to have arrived from Afghanistan in 2021, prompting Mr Trump to vow a crackdown on unvetted immigration.

Something’s blooming **Mr Trump** will visit Beijing in April. The president accepted an invitation from his Chinese counterpart, **Xi Jinping**, during a phone conversation in which they discussed trade and global security. A reciprocal visit is planned for later in 2026.

Marjorie Taylor Greene said she would resign from America’s House of Representatives

following a public feud with Mr Trump. The president had called the congresswoman from Georgia, once a staunch ally, a “traitor” for her calls to publish files related to Jeffrey Epstein, a dead sex offender.

COP 30 in Brazil ended with a disappointing lack of new promises to phase out fossil fuels. Roughly 80 delegations, including the European Union and Britain, had been pressing for quicker climate action, but large oil-producers opposed any stricter resolution. Next year’s conference will be held in Turkey after Australia dropped its hosting bid.

Jair Bolsonaro began his 27-year prison sentence for plotting a coup after losing the 2022 election. Brazil’s former president had been under house arrest since August but was recently taken into police custody for tampering with his ankle monitor. He denied attempting to flee and blamed medicine-induced “paranoia”.

China escalated its dispute with **Japan** at the United Nations. In a letter to the UN’s secretary-general, António Guterres, its representative accused Japan of “a grave violation of international law” when Takaichi Sanae, the prime minister, suggested her country would provide military assistance to Taiwan in the event of a Chinese invasion. Meanwhile **Taiwan’s** president, Lai Ching-te, said that the country would boost defence spending by \$40bn to fend off “intensifying” Chinese threats.

Several **South-East Asian** countries faced catastrophic **floods**. Some 2.7m people battled the deluge in southern Thailand; the city of Hat Yai recorded its heaviest rainfall in 300 years. The army deployed ships and helicopters to deliver aid. At least 30 people were killed by landslides on Java, Indonesia’s most populous island. In Vietnam a bus was swept off the road. Malaysia evacuated some 21,000 people.

At least 55 people were killed and hundreds were missing after a fire engulfed seven high-rise apartment blocks in **Hong Kong’s** Tai Po district. As firefighters quelled the blaze, there were mounting questions over accountability. Police arrested three construction-company employees for suspected manslaughter.

Spain’s attorney-general, Álvaro García Ortiz, resigned in anticipation of a supreme-court ruling that found him guilty of leaking details of a tax probe involving the partner of a prominent conservative politician. It is a blow to the socialist government of Pedro Sánchez, who appointed the chief prosecutor in 2022 and defended his innocence.



Italy’s parliament voted unanimously to make **femicide**—the murder of a woman because of her gender—a crime punishable by life imprisonment. The law is a response to several high-profile cases of violence against women and includes harsher measures against stalking and revenge porn.

Ukraine attacked the Shatura power station in **Russia**, which provides 6% of the electricity to nearby Moscow, the capital. The drone strike damaged three transformers. Ukraine also killed three people and injured several others in a large drone strike on Novorossiysk, a Russian port city. Russia continued to pummel Kyiv, Ukraine’s capital.

Wedded to the past The EU’s top court ruled that **Poland** must recognise the marriage of a same-sex couple,

despite Polish law not allowing such unions. It said the two men, who had been married in Germany, would thus preserve their freedom of movement and the “right to respect” for family life. Poland’s government said it would comply with the verdict.

Israel killed **Hizbullah’s** top military chief, Haytham Ali Tabatabai, in Beirut. The second major strike on Lebanon’s capital since an American-brokered ceasefire a year ago highlights the fragility of truces in the region. Israel also launched its biggest raid in the West Bank since the start of its truce with Hamas in October, with hundreds of soldiers entering Tubas, a town near the city of Nablus.

The **Gaza Humanitarian Foundation** closed. The aid group, which was supported by Israel and America, had been criticised for endangering Palestinians, many of whom were killed attempting to get food from its distribution centres (the group denied anyone died at its centres). Since October more aid has entered the Gaza Strip.

Gunmen abducted 303 school-children and 12 teachers from a Catholic school in **Nigeria’s** Niger state, with dozens managing to escape. Separately, 24 girls who had earlier been abducted from a boarding school in Kebbi state were freed; another had escaped on her own. Nigeria has closed schools nationwide as kidnappings have intensified in recent weeks.

A group of soldiers seized power in **Guinea-Bissau**, a narco-state in west Africa, and detained the president. The apparent coup follows a disputed presidential election in which both the incumbent, Umaro Sissoco Embaló, and his main opponent claimed victory before formal results. The putschists claimed that they acted to counter attempts to destabilise the country.

The world this week Business



Rachel Reeves, Britain's chancellor, delivered her second budget, which by 2029-30 will increase yearly spending by £11bn (\$14.5bn) and taxes by £26bn. The extra spending starts now, but taxes will rise only gradually, so the government will need to borrow more than planned over the next four years. It has made no serious attempt to cut its ballooning welfare bill. Markets nevertheless reacted positively: government-borrowing costs fell, especially for long-dated debt, and the pound strengthened.

Meanwhile, France's National Assembly rejected parts of a budget draft put forward by Sébastien Lecornu, the country's third prime minister in 12 months. Both of Mr Lecornu's immediate predecessors left office after failing to pass their own budgets.

The IMF agreed a new four-year funding programme with Ukraine, worth \$8.2bn. It will be used to help stabilise the country's economy and meet the mounting costs of its war with Russia. Ukrainian officials believe the facility will help them obtain funding from others, which is badly needed to shore up the public finances.

Tech stocks staged a recovery after a difficult few weeks. America's NASDAQ 100 index fell by 8% between late October and November 20th, but has since risen by 5%. Investors' hopes were buoyed by comments from Mary Daly and Chris Waller, two attendees of the Federal Reserve's monetary-policy meetings, suggesting the central bank will cut interest rates in December.

Traders now put the probability of such a cut at over 80%.

Yet the share price of Nvidia slid further. Reports on November 24th suggested that Meta, one of Nvidia's biggest clients, is considering buying chips from Google instead. The next day Nvidia lost over \$100bn, or 3%, of its market value. It has fallen by 13% since its peak. The same day the share price of AMD, Nvidia's main rival, dropped by 4%. That of Alphabet, Google's parent, has soared.

Paper hands

Owners of bitcoin are suffering badly: its price has plunged by 27% since October. Many "crypto treasury" firms, which exist to hold digital assets and give shareholders exposure to them, have done far worse. Some have reportedly started selling their stockpiles as a result, raising fears of a self-reinforcing doom loop.

Chinese "open" artificial-intelligence models, which are free to download and tweak, are overtaking American ones. A study by the Massachusetts Institute of Technology found that Chinese models' share of downloads over the year to

August was 17%, compared with 16% for American models.

Robinhood said it intends to launch a futures and derivatives exchange, together with Susquehanna. The retail broker and marketmaker are partnering up to offer a range of prediction contracts linked to events such as sports matches and elections.

BHP abandoned its takeover bid for Anglo American, a smaller mining rival. Anglo American is instead merging with Teck Resources, and has turned down bids from BHP twice in the past 18 months. The two merging companies run neighbouring copper mines in Chile, and once joined will rank among the top five producers of the metal globally.

Decades after it started investing in China, Volkswagen now says it can build electric cars made entirely in the country. Compared with production costs in Germany, those in China are around 50% lower for some models. Europe's largest carmaker plans to release about 30 types of electric vehicle in China over the next five years. It has also been trying to cut the number of workers it em-

ploys in Germany by 35,000. This year, progress has slowed, as far fewer people have quit voluntarily.

Chain reaction

Investors are increasingly betting that nuclear energy will power artificial intelligence. X-energy, a company backed by Amazon, has raised \$700m to build nearly 150 small modular reactors in America and Britain. Valar Atomics and Aalo Atomics, two rival nuclear-reactor builders, have also raised funds recently.

A potential treatment for Alzheimer's, developed by Novo Nordisk and already used as a diabetes drug, failed a late-stage trial. The pharmaceutical giant's share price dropped sharply in response, continuing a long slide. Meanwhile Eli Lilly, one of Novo Nordisk's rivals, became the first health-care firm to reach a market value above \$1trn.

"Wicked: For Good", the second part of a film based on the hit Broadway musical, pulled in \$150m in American ticket sales on its opening weekend. Its performance was the second-best of the year so far, behind "A Minecraft Movie".



What China will dominate next

The country's high-speed innovation holds lessons for the world

THOSE WHO worry about how to cope with China's leadership in technology—and there are plenty of them—think hard about electric vehicles (EVs), solar panels and open-source artificial intelligence. For such people, we have some bad news. This week we report how China is rapidly pressing ahead in two other frontier technologies, autonomous vehicles and new drugs. As these industries spread around the world, they will exemplify the power of Chinese innovation.

China's progress in each of these important areas has been staggering. A robotaxi revolution is gathering pace, which could reshape transport, logistics and everyday urban life (see Finance & economics section). The country's autonomous taxis, constructed for a third of the cost of Waymo's in America, are racking up millions of kilometres of driving and are forging partnerships in Europe and the Middle East. In medicine, meanwhile, China has turned itself from a copycat maker of generics into the world's second-largest developer of new drugs, including those tackling cancer. Western rivals are licensing its firms' wares. The day when a pharma giant emerges from China no longer seems so remote.

The rise of both industries says much about how Chinese innovation works. A deep pool of talent, a broad manufacturing base and huge scale combine to propel it rapidly up the value chain. The production of robotaxis has piggybacked on mass EV manufacturing and a dominance in the supply of lidars and the other sensors needed for self-driving (see Business section); scale has also helped bring down costs. Armies of patients enlisted in clinical trials and profits from generic drug-making have speeded up pharma innovation.

A more surprising ingredient of China's success is its nimble and permissive regulators. As in other industries, local governments have offered firms cheap credit and other help. But it is agile rulemaking that has really turbocharged progress. Soon after political leaders set out their ambition for China to become a "biotechnology superpower" in 2016, the country implemented a number of reforms. The drug regulator's workforce quadrupled between 2015 and 2018, and a backlog of 20,000 new drug applications was cleared in just two years. The time taken to secure approval for human trials shrank from 501 days to 87. Last year firms in the country ran a third of the world's clinical trials (see China section).

Likewise, China was early to experiment with robotaxis. Local officials, keen to attract talent and investment, approved pilots at a rapid clip and installed sensors and other digital infrastructure to help guide self-driving vehicles; trials have run in over 50 cities. Many have experimented, too, with laws on liabilities and guidelines for testing. Though accidents have sometimes caused a hiatus, pilot schemes have helped engineers and policymakers understand the new technology.

Cut-throat competition at home imposes harsh conditions on individual companies, but the survivors are conditioned into becoming hypercompetitive export champions. China's robotaxi operators compete with each other and with cheap

human-driven taxis in an economy gripped by deflation. New technologies receive subsidies that ultimately come out of the pockets of its underpaid people. Many loss-making enterprises will not survive the resulting price wars. But those that do will look overseas to make money.

A new wave of Chinese low-cost innovation will therefore wash around the world. It will do so in different ways. China's cheap medicines could bring benefits, and particularly to the developing world. But for its companies America's lucrative market, which is the source of 70% of global pharma profits, is the juiciest prize. And China's importance for the pipelines of Western drugmakers means that the relationship could even be symbiotic. Robotaxis, by contrast, are likely to follow the more usual path for China's tech exports. They are blocked by America, which has its own industry and acute security concerns, but will probably gain a foothold in other places, where domestic efforts at autonomy lag far behind.

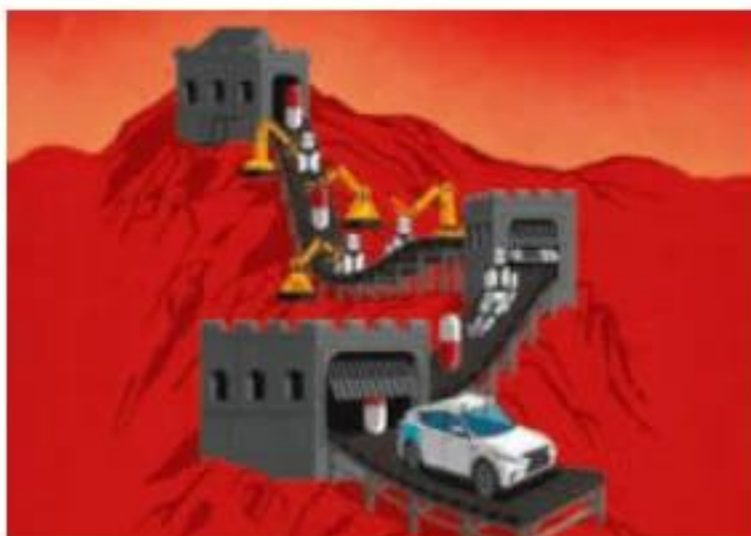
How should the rest of the world respond? The competition risks hollowing out Western economies. Where there is evidence of Chinese dumping and subsidies, counter-measures against Chinese exports are justified and necessary. Where there are security risks action is justified, too. The data collected by robotaxis could pose a surveillance threat; Chinese pharma has suffered corruption scandals. Yet knee-jerk protectionism in the name of security or safety would be a mistake. Blocking or limiting the fruits of Chinese innovation would deprive consumers of the benefits of cheaper and better drugs and transport at a time when voters worry about affordability.

That is why it would be better for Western economies to rethink how innovation works at home. It is tempting to be fatalistic about China's rise—to conclude that its dominance over the technologies of the future can be achieved only through authoritarian diktats and wasteful handouts, and that democracies therefore cannot follow in its footsteps. But the inventiveness of China's private sector and agility of its regulators have been crucial ingredients, too. Here, alas, the West is going in the wrong direction.

Life in the slow lane

America has scale and the deep pockets to compete. But in many states, particularly Democratic ones, regulators are blocking or stalling autonomous vehicles. The government is waging war on universities and cutting funding for basic research. As in other Western countries, it is hostile to immigrants, including gifted ones. In drugs, as China's share of clinical trials has risen, Europe is losing ground. Its economies desperately need to integrate further so that they can finance and develop new technologies. There too, regulators often prize safety at the expense of risk-taking and experiment.

Nothing says that China must own the future. But if the West wants to compete in self-driving cars and medicine, let alone EVs, solar power and other vital technologies, it must learn the right lessons from China's rise. ■



Fiscal policy

Britain's bodge-it

The Labour government is failing to give Britain what it needs

BRITAIN IS IN alarming decline. Its paltry productivity growth, high borrowing costs and incoherent economic policy are bad enough. But the country also risks the collapse of the political centre ground. The combined polling share of the populist-right Reform UK and populist-left Green parties now exceeds that of the Labour and Conservative Parties, the duopoly that has dominated British politics for over a century.

The brutal truth is that eventually, one way or another, radical change is coming to Britain. Either today's centre-left government will choose the dramatic change that fixes the economy, or change will be forced upon the country by the financial markets or by voters stampeding towards the extremes.

This was the backdrop to the budget, presented on November 26th by Rachel Reeves, the chancellor of the exchequer. It is why this should have been a moment of radicalism by choice. Instead Ms Reeves offered a bodge job. The government seemed immobilised by its peril. Compounding her administration's earlier mistakes, the chancellor failed utterly to lessen Britain's economic and political vulnerability.

The immediate task was to restore fiscal credibility after official forecasts were downgraded to reflect, at last, Britain's dire productivity trajectory. In attempting to accomplish this, the chancellor portrayed herself as a paragon of prudence. It was, after all, the second year in a row that she was filling a hole in the budget, not entirely of her own making, to meet her targets.

Compared with Reform and the Greens, Ms Reeves is indeed prudent. But that is no standard at all. With the deficit still gaping at 4.5% of GDP, Ms Reeves succumbed to her own worst instincts and those of her backbenchers by increasing borrowing, relative to her previous plans, for four years (even by the old growth forecast). Only in April 2029 does her extra fiscal consolidation bite. Even if she sticks to those policies in later budgets, her government will by then be at the end of its term. It may already be out of office. Meanwhile, the chance that Ms Reeves will have more holes to fill is alarmingly high: officials gauge the probability of meeting one of her debt targets as just 52%.

The consolidation was backloaded for two reasons. First, Labour chose to quench the thirst of its backbenchers for more spending. Ms Reeves rightly abolished a crude rule restricting parents' benefits to two children. But she balked at offsetting this by spending less on Britain's coddled pensioners and the many benefits claimants who have recently gamed the system. Since coming to office, Labour has tried and failed at both reforms, and has displayed little appetite to try again. Ms Reeves crowed over a projection that one Labour reform would get 15,000 people off benefits and back to work. That is feeble. Since 2019 disability-benefits claimants in England and Wales have increased by 1.2m (40%).

The second cause of delay is that the government was too timid to raise headline rates of tax, which would have violated a manifesto pledge. Instead the chancellor extended by three years, beyond 2027-28, a freeze on tax thresholds, meaning

that inflation will fill the coffers only gradually. Eventually there will also be a new tax on pension contributions, one of many minor new levies, most of dubious merit.

If and when taxes do catch up with spending, they will reach 38% of GDP, the highest in the post-war era. That is roughly the same as Germany, higher than Spain and not far off Norway and Sweden. This is not all the chancellor's fault: Britain is ageing and it needs to spend more on defence. Yet she was careless about incentives to work and invest. The tax system's many high marginal rates and cliff-edges remain, and Ms Reeves added to the complexity. A new levy on expensive homes might have been welcome but for its poor design. The tax treatment of savings will become even more fiddly, with an exemption for over-65s that is a handout to the old. Gambling taxes will go up, but bingo taxes will be scrapped.

The budget thus followed a pattern of obfuscation and superficiality that is well-established, but increasingly costly. Chancellors tinker while the country stagnates. That a Labour leadership with a working majority of 169 has to behave in the same unserious way reveals its staggering political mismanagement. This started in 2024 with its ham-fisted attempt outside the normal budget process to save a small amount of money by withdrawing an annual cash handout to pensioners.

The tragedy is that Britain's economy has plenty going for it, if only it were better run. The country is younger, and ageing more slowly, than other large economies in Europe. It is a relative front-runner in adopting AI. Its labour market is more flexible (albeit getting less so under Labour—see Bagehot). The belt-tightening needed to stabilise its debt-to-GDP ratio is about a third smaller than in neighbouring France. There is no immediate economic crisis, by contrast with deindustrialising Germany. Its problems—chiefly high housing and energy costs—are long-running and there is no mystery about how to alleviate them.

In 1945, 1979 and 1997 British governments remade the social contract with ambitious reforms that were often emulated overseas, including William Beveridge's welfare state and Margaret Thatcher's privatisations. In contrast, Labour's talk on reform runs far ahead of its actions (see Britain section). Its housing policy has been timid and it has no solution to the economic drag from Brexit. On energy prices, which are among the highest in Europe, the budget's big idea was to shift costs around, not bring them down.

Grant me prudence, but not yet

After this budget, the drift towards populism will surely continue. Reform, led by Nigel Farage, has been moderating as power beckons, but is untested and vague. The Greens are led by Zack Polanski, who once agreed to enlarge a woman's breasts using hypnosis. He now promises voters a gobbledygook fiscal rule by which "Inflation doesn't go higher than the skills and resources that we have in our economy." Charlatans can't solve Britain's problems. Neither, it seems, can Labour. ■



The war in Ukraine

Ambush averted

What Ukraine and Europe should learn from Donald Trump's attempt to impose peace

HAS UKRAINE'S moment of maximum diplomatic danger passed? It looks that way, at least for now. A week after the leak of a 28-point surrender plan, America's secretary of state, Senate Republicans and European leaders have managed to get a hand on the controls. They will seek to protect Ukraine in talks—though, this being Trumpland, nobody can be sure that they will be able to scotch the plan's most harmful elements. And even if they succeed, the choices confronting Ukraine and its backers in Europe are only going to get harder.

The original plan pretended to be about peace, but in reality paved the way to the next war by hampering Ukraine's ability to defend itself, rewarding Vladimir Putin's aggression and setting up sanctions relief and investment that would provide Russia with the cash to rearm. The plan promised to meet a future Russian attack with "a decisive co-ordinated military response", but there were no details and the prospect of Donald Trump—or any American president—going head to head with nuclear-armed Russia over Ukraine is not credible.

Talks continue. Encouragingly, the Americans have relaxed a deadline of Thanksgiving and backed away from a reported threat to deprive Ukraine of American intelligence and weapons if Volodymyr Zelensky does not sign a deal. Mr Zelensky and his European allies have also won some concessions. But much remains to be negotiated, and each step towards an agreement that could offer Ukraine the foundation of a secure future will, for that very reason, provoke fresh objections from Russia (see Europe section). If no plan can be contrived that is acceptable to both sides, even under American pressure, then the fighting will continue.

How then will the war end? This newspaper has long argued that for Ukraine success means emerging as a thriving,

Western-leaning democracy. Yet each of those things is increasingly in doubt. To thrive, Ukraine needs capital and people to return. But if Russia is likely to attack again, capital and people will flee. To be Westward-leaning, Ukraine must be bound into European political, economic and defence networks. But if America imposes an unjust peace and Europe cannot protect their country, Ukrainians will feel betrayed. To be a healthy democracy, Ukraine's politicians must provide leadership. However, the 28-point plan was leaked as a vast corruption scandal rocked the increasingly centralised and unpopular government of Mr Zelensky (see By invitation).

Yet, despite what some around Mr Trump insist, defeat is not inevitable. Saying it is only hastens it. Mr Putin is paying a terrible price for each metre of Ukrainian soil. The Russian economy can sustain the war, but is under pressure. Money is getting tighter. Without big cuts in output, oil prices, which averaged just above \$80 a barrel in 2023 and 2024, are forecast to fall into the \$50s next year and reach the \$30s by the end of 2027. Polling suggests that most ordinary

Russians try not to think about the war. Given that they are not fired up by patriotic fervour, how much suffering will it take to alert them to the waste of Russian lives and treasure?

The rub is that, in this war of attrition, Ukraine lacks men and weapons—Russia is making more drones and can breach its air defences. Europe, with an economy ten times bigger than Russia's, could help solve this by a generous, multi-year commitment of money. Its leaders understand the threat, but cannot seem to turn words into actions. Just last month the European Union failed to agree on a plan to seize €140bn (\$160bn) of Russian assets. If Europe continues to work on Brussels time, help will come too late to save Ukraine. ■



The yen

Too late, Takaichi

Japan's big-spending prime minister is ten years out of date

TOURISTS IN THE bars of Tokyo are rejoicing. Visiting Japan was once a mightily expensive endeavour; now it is cheaper than ever. The yen has fallen by 9% against the dollar in the past six months, and has never been weaker against the euro in the single currency's 27 years.

The yen is not the only thing declining in value. Japan's long-term government bonds have slumped in price, raising their yields. Those maturing in ten years now yield 1.8%, up from around zero for much of the period between 2016 and 2021. Yields on 30-year bonds have risen to 3.3%, the highest such since long-dated debt was first issued in 1999. Investors are becoming more fretful about the big-spending instincts of Takaichi Sanae, Japan's new prime minister.

Ms Takaichi has announced a supplementary budget of ¥17.7trn (\$113bn). Although that is a small share of GDP, it sends a bad signal. She has also been an outspoken critic of the Bank of Japan's modest increases in interest rates. In an era of higher inflation and higher bond yields, her policies are as out of date as tired reboots of Hollywood franchises.

The market dynamic Japan now faces—yields up, currency down—is becoming increasingly familiar. It used to be associated with troubled developing economies, which suffered in this way when foreign investors dumped local assets and exited their foreign-exchange positions at the same time. But it has spread to rich countries, too. In 2022, during the short-lived tenure of Liz Truss, British gilt yields surged and the

► pound slumped, as some pension-fund strategies blew up. Earlier this year, investors sold American Treasuries and the dollar as they worried about Donald Trump's erratic trade policy.

Japan's enormous stock of government debt means that even small rises in bond yields translate into surging interest bills. In recent years the country avoided trouble because its immediate fiscal position had been improving. At around 1.3% of GDP this year, its budget deficit is much smaller than those of Britain or America. Inflation, which is currently running at around 3%, has helped reduce the government's net debt to 130% of GDP, down from 162% five years ago.

That improvement has come at the expense of consumers' purchasing power, especially hurting those on low and fixed incomes. And it is unlikely to last. The IMF expects Japan's deficit to rise to around 4.4% of GDP by 2030, well above the country's predicted growth rate. Spending on defence and an ageing population, and rising bond yields, will start to take a toll.

So far, there have been few signs of financial distress akin to those seen in Britain during the Truss episode. Indeed, that precise form of blow-up looks less likely in Japan, because

many of its biggest investors, such as its life insurers, combine unhedged foreign assets with yen-denominated liabilities, meaning that they benefit from a falling currency. But other risks could surface. One danger is a loss of faith in Japan that translates into disruptive capital flight. Whereas the Bank of Japan has been reluctant to raise interest rates decisively, a more protracted sell-off would spur it into action, regardless of Ms Takaichi's objections. The finance ministry may have to use some of the country's \$1.3trn in foreign-exchange reserves to defend the yen, too.

Ms Takaichi says that she is following in the footsteps of the late Abe Shinzo, who as prime minister a decade ago promised to combine structural reform with monetary and fiscal stimulus. In reality Abe proved to be much more fiscally conservative than his rhetoric suggested. Moreover, the yen is no longer overvalued, and Japan is no longer trying to escape prolonged deflation. As the economic picture has changed, so should the prescription. In a yields-up, yen-down world, Ms Takaichi's big-spending, low-rate ambitions are storing up more trouble than they are worth. ■

An offer from Tehran

Iran extends a hand

The West should heed Iran's call to restart nuclear talks

VISIT TEHRAN, as *The Economist* just did, and you might expect to find Iran's rulers huddled defensively. It has been a brutal year for an unloved regime. A 12-day bombing campaign in June saw Israel, aided by American B-2s, pummel the country's nuclear sites. Iran's homegrown uranium-enrichment programme remains under rubble. Israeli strikes killed many senior military men and nuclear physicists. Walk around the city and scars from those attacks are still visible. Plaques commemorate the dead.

And yet Tehran's leaders sound eager to open up to the world. In an interview, Abbas Araghchi, the foreign minister, called for talks to resume with America's envoy, Steve Witkoff (see Briefing). He claims negotiations over peaceful uranium enrichment were about to bear fruit just before the missiles flew. A deal could include a proposal for outsiders, even Americans, to oversee peaceful enrichment on Iranian soil. On a visit to Washington, Saudi Arabia's de facto leader, Muhammad bin Salman, is thought to have delivered a similar message from Iran to Donald Trump.

How should outsiders respond? Sceptics see only duplicity from a regime with a rotten record. Undoubtedly Iran wants time to restock supplies of its most effective conventional missiles. (The fear in Tehran is that Israel's attacks will resume before its prime minister, Binyamin Netanyahu, faces elections next year.) Some see a bigger risk. Polls suggest that ordinary Iranians have been consistently keen for their country to get a nuclear bomb. What if scientists and weapons experts, making use of hidden enrichment sites, now dash to do just that, with talks as a smokescreen? Impossible, retorts the foreign minister. He claims, though others dispute it, that all 400kg of Iran's highly enriched uranium is safely under rubble. A scramble for

a weapon is out of the question, he says.

Sceptics are right that talks come with risks. Yet missed opportunities also bear a cost. Mr Trump now says he is "totally open" to a deal, even though he scrapped the last one, struck in 2015. His change of heart, if real, may be an acknowledgment that bombing Iran into giving up its nuclear ambitions, knowledge or capacity is not a permanent solution. He should make clear to Israel that a further round of bombing is unacceptable as long as talks remain possible.

Iran's regime is getting weaker abroad, as its proxy militia forces in the region are diminished. It has softened some old rivalries, including with Saudi Arabia. At home, too, the regime

in some ways is getting less extreme. The despised morality police have given up enforcing a law that women must wear the *hijab*. Clerics have less sway. Official appeals to Shia Islam as a uniting force are less strident, replaced by use of nationalist, Persian symbols. The supreme leader, Ayatollah Ali Khamenei, agreed to the 2015 nuclear agreement to keep uranium enrichment within strict limits. He looks ready,

again, for his government to engage with the West. Yet he is 86. After his death a battle for succession could bring a new shift in power between reformists and hardliners. If the revolutionary guards prevail, they may prefer isolation to detente, as their front companies profit under sanctions.

In their different ways, all these factors offer an unusual opportunity to put relations between Iran and America on a new footing. Engagement could make the hardliners in Iran less powerful; certainly, another round of diplomatic hostility will benefit them. For now, a window is open. Mr Trump should send an envoy to Tehran to learn what sort of deal, if any, might be struck. ■



Letters *Taiwan's economy, Britain's image abroad, facial analysis in hiring, the decline of relationships*

Unsafe as houses

You identified "The hidden risks in Taiwan's boom" (November 15th) arising from the central bank's weak-currency policy. But the more fundamental issue is the low-taxation regime on property holdings. The cost of holding real estate in Taiwan is virtually nil. Vacancy taxes exist only on paper and land-value assessments remain far below market prices. You mentioned how central-bank liquidity inflates housing prices, but the crucial point is that the tax system has deliberately built an express highway to funnel these funds straight into property.

This is not some conspiracy, but the cumulative result of decades of profit-seeking by all parties. Cultural attachment to property ownership certainly exists, but culture is never destiny. What makes this structure impregnable is its perfect alignment with the core interests of Taiwan's political-donation system. Financial conglomerates profit from mortgages, developers and landowners from soaring prices, and politico-business networks from land development. These vested interests are the primary bankrollers of Taiwan's electoral politics.

The result is a zero-sum game in which the entire population is forced to participate. Younger generations shoulder mortgages with price-to-income ratios of 10-20, the middle class become reluctant "investors" to preserve wealth, and genuine productive investment languishes as capital is drained into property. This is the true root of Taiwan's low wages, weak consumption and collapsing birth rates.

You worry about American trade pressure, but anyone familiar with Taiwan's political reality knows that compared with Washington's potential tariff threats, Taipei's vested

interest groups are the real obstacle to reform. This is not a technical currency question, but a political-economy Gordian knot.

WANG WAN-YU
Chairperson
New Power Party
Taipei

Britain's reputation

It is true that Britain enjoys a positive international image ("Brand Britain has bounced back", November 8th). But the brand hasn't "bounced back", because it has always been strong. Your article cited my annual study, the Anholt Nation Brands Index (NBI). In the NBI Britain's rank has never fallen below sixth and typically meanders between third and fourth. More tellingly, and in common with every country we track except Russia, Britain's overall global score has gradually risen since we started measuring it in 2005 (a weird phenomenon we call the "mood of humanity" causes the images of all countries to improve over time).

Aside from this gentle

undercurrent, there's nothing unusual about the stability of Britain's image. People really don't like to change their minds about other countries and it is extremely rare for any country's score to change from year to year by a statistically significant amount. That is apart from America's, which has a uniquely volatile image.

This looks at image from a global perspective. A more meaningful way to study perceptions of countries is to focus on specific population groups in each country. Britain was ranked fourth in this year's NBI by respondents in G7 countries (where it is gradually rising), but was seventh among BRICS+ respondents (where it is gradually falling). Britain is also slightly preferred by females and older respondents than by males and younger respondents.

SIMON ANHOLT
Founder
Anholt Nation Brands Index
Scratby, Norfolk

It's the economy, cupid

Your briefing on the rise of singlehood and the decline of relationships offered a number of interesting potential explanations ("The great relationship recession", November 8th). One other obvious factor is economic. If children are the ultimate goal of a relationship, and the cost of raising children

continues to skyrocket, shouldn't we expect fewer and fewer people to tie the knot?

JAKE THOMPSON
Cash-strapped father of two
Batavia, Illinois

Another reason for the decline of relationships is the impact of aggressive human-resources policies in the workplace. In the past many companies served as informal marriage bureaus, until starting a relationship at work became far too risky.

RICHARD WORSLEY
Chichester, West Sussex

I was disappointed to read your interpretation of marriage as a binary choice of either marrying up or down. Any possibility of marrying an equal nowadays?

TOMAS GOMEZ
Not-married yet
Paris

You pointed out that most women on online-dating apps are looking for a man who is at least six-feet tall. They may be in luck because, according to a blog post on OkCupid, men on those same dating apps claim to be two inches taller than they really are.

ALAN BUXTON
Rickmansworth, Hertfordshire

You noted the emerging trend of turning to an AI "companion" instead of a real partner ("My boyfriend is a model", November 8th). The Rolling Stones forecast this in 1967. The band's song, "2000 Man", predicted: "Well, my wife still respects me, I really misused her. I am having an affair with the random computer." Perhaps they will write another song predicting the end of AI centuries in the future. Keith Richards should still be around to see that happen.

STAN KOWALSKI
Concord, New Hampshire

Nice to "see" you

Bartleby's column on using artificial intelligence in hiring (November 8th) raised important ethical questions. Companies are already doing this and it's fundamentally broken. Hilke Schellmann, a journalist, tested AI interview platforms and answered every question with "I love teamwork". She still received good scores. When she answered entirely in German for an English-language position she was rated 73% qualified. Despite these obvious flaws, employers use such tools even when nearly 90% admit that the tools reject qualified applicants.

This has triggered an arms race, with job candi-

dates embedding hidden AI prompts in résumés (ManpowerGroup detects this in 10% of applications). Companies are now responding to "interview fraud" by requiring in-person rather than video meetings.

EUGENE YIGA
Barcelona



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BY INVITATION

Alexander Rodnyansky

A former adviser to Volodymyr Zelensky on why Ukraine must change how it is governed



TODAY'S HEADLINES are dominated by a draft peace plan that could amount to managed capitulation for Ukraine. Just as worrying is the state of the government expected to sign it. For the past few weeks Ukrainians have been digesting grim details from a huge corruption scandal. But the Energoatom affair, a \$100m kickback scheme at the state nuclear operator, is not just another episode of wartime graft. It has become a test of whether Ukraine's leadership can reform the system it built, or if that system has turned into one of the Kremlin's most valuable assets.

The outline of the scandal is now familiar. After a 15-month probe, Ukraine's anti-corruption agencies revealed that intermediaries allegedly skimmed 10-15% from Energoatom contracts, including those meant to protect substations from Russian missiles. Investigators said the money was routed through a network linked to Timur Mindich, a business associate of Kvartal 95, President Volodymyr Zelensky's media company, who left the country just before searches began. Two ministers have been forced out. The entire supervisory board of Energoatom has been dismissed. Sanctions have been slapped on Mr Mindich and an associate. On paper, the system is working: detectives investigate, prosecutors indict, ministers resign; Brussels declares itself reassured. Look more closely, though, and a different picture emerges.

This would be damaging at any time, but it is disastrous now. Contrary to repeated predictions of an imminent collapse, Russia's economy has adapted to the war. The Kremlin is spending 7-8% of GDP on defence, and independent analysts estimate remaining fiscal capacity in years, not months. Ukraine, by contrast, spends close to a third of its GDP on the armed forces and can pay pensions and basic services only thanks to foreign aid. At the same time a mobilisation crisis is quietly unfolding: prosecutors have opened over 300,000 cases related to absence without leave and desertion since the full-scale invasion began.

It is into this already precarious situation that the Energoatom scandal drops. To European voters, it looks like a textbook example of corruption. Still, the immediate danger is not that Europe will abruptly abandon Ukraine; it is that support will become slower, stingier and more conditional just when Ukraine needs a

predictable framework to stabilise the front and the economy.

Mr Zelensky's own response captures the ambiguity of this moment. In a recent address, he reminded Ukrainians of their dignity and warned that the country faces one of the most difficult choices in its history, between accepting some version of the draft peace plan or risking isolation. He also urged the political class to "end the mudslinging". It sounded less like a head of state confronting systemic failure than like a new season of "Servant of the People", the satirical television show in which Mr Zelensky once starred: the leader appealing over the heads of a discredited establishment which he, in fact, assembled and protected.

Behind this lies a broader governing philosophy. Since 2019 the presidential team has systematically personalised power. The cabinet has been treated less as an independent centre of policymaking than as an administrative extension of the presidential office. Loyalty has trumped competence. Institutional roles have been devalued; boards and commissions have been populated with friends and "practitioners" who measure success by surviving scandals, not by preventing them.

In all my years in government, they never mistook me for a "practitioner". I was a theorist. The insinuation was clear: I wasn't qualified to help with Ukraine's transformation. I recall a close associate of the president once telling me that the real test of an economics "practitioner" wasn't macroeconomics, but whether you could survive prison if fate sent you there. On that front, he and his circle held the advantage. I had to admit that my Princeton PhD in economics had skipped that part of the curriculum.

What happens next may be decisive in the medium term. Corruption scandals will almost certainly continue to develop, with more tapes, names and resignations. The president will denounce accusations, remove a few expendable figures, invoke national dignity and accuse his critics of undermining unity. The prime minister, Yulia Svyrydenko, will be kept in place long enough to front the "clean-up", even though she oversaw the formation of the nuclear company's supervisory board when she was economy minister. The president has, in effect, tasked her with investigating her own institutional design, hoping no one will notice. Ms Svyrydenko, who took up the post in July, has barely been mentioned so far—but largely because almost no one knows who she is. This anonymity is not a bug; it is a central feature of the appointment: a prime minister sufficiently colourless not to compete with the president and invisible enough to absorb blame without attracting attention.

Mr Zelensky is unlikely to change course voluntarily. He will continue to shift blame downward and sideways, and to argue that any talk of political change only helps Russia. Might he consider a different script? Only if the scandal, combined with the onerous peace plan, leaves him facing a choice between personally accepting deeply unpopular terms or stepping aside.

For Ukraine's partners, the taboo question now is not whether corruption is pervasive, but whether the current leadership is still part of the solution, or has become part of the problem. Ukraine's soldiers are still buying time at the front. Whether that time is used to overhaul a compromised system, or simply to extend the life of a long-running political series, will determine not only the quality of any eventual peace, but who will be left to sign it. ■

Alexander Rodnyansky served for five years as an economic adviser to Volodymyr Zelensky. He is a professor at the University of Cambridge.

ECONOMIST
IMPACT

Enterprise AI in action



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Few outsiders hear what directors say in boardrooms, but one safe bet is that AI dominates most agendas. In the latest quarter of 2025, executives at 57% of S&P 500 firms mentioned it on earnings calls. Yet a survey by America's Census Bureau finds that in September this year only about a tenth of firms had used AI in the previous fortnight. **Enterprise AI in action**, a new series by Economist Impact, examines how to turn AI talk into working practice.

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Our first three articles consider how to build AI-ready firms. They pair insights from Erik Brynjolfsson, a leading thinker on how AI changes work, with examples of AI in action from two firms starting to use it meaningfully: IKEA and LVMH.

The question vexing many executives is why AI dazzles in prototypes yet disappoints in real-life productivity. The reason, says Mr Brynjolfsson, is that AI is often adopted without organisational change. Firms must invest in new processes, skills and roles that complement AI to gain from it. The result is a productivity "J-curve", where AI spending rises before output does. Mr Brynjolfsson argues that to shorten the dip, firms must organise work around tasks, not titles, and use AI to augment rather than replace human judgement. The largest gains will come to those that build "centaur" teams where humans and AI learn from each other and measure returns with a statistician's discipline.

The series then turns to action and how IKEA is assembling an AI firm. The Swedish retailer approaches AI like its furniture: modular, practical and accessible. It sets firm limits—no AI in hiring or surveillance—then prioritises AI projects through its "democratic design" principles of sustainability, quality and affordability. It puts AI literacy on a par with its mandatory health-and-safety training to build common understanding across 70,000 employees, allowing local teams to adapt central tools to their needs, whether in-store operations or supply-chain planning. The results have been impressive, from forecasting systems that keep meatballs in stock to room planners that save hours of manual slog. One of many lessons here is that once guardrails and priorities are set and staff are empowered to build with AI, meaningful use of the technology tends to self-assemble.

LVMH offers another story, of how AI can strengthen a business without remaking it. The luxury group starts by recognising

core strengths—craftsmanship, attentive service and years of client data—and uses AI to extend them without losing the atelier's touch. In LVMH stores, the technology cuts routine work so advisers can spend more time with clients and, in studios, algorithms disturb the creative process while leaving final design choices to creatives. To wield scale and minimise risk, LVMH develops new AI tools with major brands like Louis Vuitton and Dior, before rolling them out across the group. The lesson is practical: wield your strengths and use AI to sharpen your edge.



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Briefing Iran after the war



Emollient mullahs

TEHRAN

Why Iran is making surprising overtures to America

IT IS BARELY five months since America broke off negotiations over Iran's nuclear programme and joined Israel in a lopsided 12-day bombing campaign against the Islamic Republic. Its air defences were pulverised, its top generals killed, its nuclear sites buried. The injured regime's natural response might have been to lick its wounds and curse the two Satans, great and little. Yet its foreign minister, Abbas Araghchi, is signalling just the opposite.

That Mr Araghchi invited *The Economist* to Tehran for an interview was surprising enough. That he conducted the interview in English, against the advice of his media team, was even more unusual. That he agreed to speak to a correspondent whom the Iranian authorities had previously detained was yet more striking still. All these unexpected overtures appeared designed to underline the most remarkable thing of all: what he said. Iran, far from stewing in resentment, was ready to strike a "fair and balanced deal" with America,

Mr Araghchi declared. Muhammad bin Salman, the crown prince of Saudi Arabia, is thought to have conveyed the same message directly to President Donald Trump on Iran's behalf during a visit to Washington on November 18th. The regime, says an Iranian analyst, is desperate for a deal.

Good posturing

Mr Araghchi does not want to appear a pushover. "We are ready for negotiation, but not for dictation," he cautions. Should it come to another fight, he says, Iran is ready, having learned some hard lessons from the 12-day war. It has already built a bigger and better stockpile of missiles, he claims. Iranian television channels broadcast endless images of secret bases in the desert bristling with missiles, of men in

black fatigues carting munitions about and of devastating explosions that turn the sky red. "The night is long and the dervish is awake," another official pronounces.

For the most part, this is bluster. Two of Iran's three "prongs" of deterrence—its proxy militias around the Middle East and its nuclear programme—have been badly blunted. Israel has smashed Hamas and Hizbullah, previously the most threatening proxies. Houthi militants remain active in Yemen, but they are only a distant irritant for Israel. The American and Israeli strikes have also set back Iran's nuclear programme. Whether owing to the bombing or out of prudence Mr Araghchi does not say, but enrichment "has now stopped".

But the uncertainty surrounding the fate of the 400kg of uranium that Iran had enriched almost to weapons grade still gives Iran some leverage in any future negotiation. The regime has barred UN inspectors from visiting the bombed nuclear sites where, Mr Araghchi says, Iran's stock-

→ ALSO IN THIS SECTION

18 The view from Israel

► pile lies buried. Western spies suspect that it managed to spirit out enough fissile material to make at least one nuclear device before the bombs fell. It may also have undetected enrichment facilities.

And there is always the possibility that a battered and cornered Iran becomes more dangerous. Some within its security establishment think its response to Israel's and America's attacks was "too calibrated". Next time, says Hamzeh Safavi, an analyst and son of a former head of the Islamic Revolutionary Guard Corps (IRGC), the regime's praetorian guard, American bases in the Gulf would be fair game. "We'll hit back at any base in any country that helps an attack on Iran," vows yet another official. An attack on the Gulf states, in turn, would cause economic chaos and unleash a regional conflagration.

Yet Iran is clearly not seeking negotiations from a position of strength. Both domestically and internationally, the regime is in a bind. Although China buys its oil in defiance of American sanctions, it may not be willing to supply weapons. Russia might have fewer qualms, but has fewer weapons to spare. The economy is a mess. A newspaper editor who talks of national "decline" rattles off problems faced by ordinary Iranians, including water shortages, power cuts, choking smog and soaring prices. Popular discontent is visible in protests about all these scourges. Engagement with the West—however ideologically distasteful—is becoming a necessity.

Inflation is rampant. The price of rice has doubled in a year; onions are up 70% and cooking oil 40%. The slumping rial compounds the problem. Between 2018 and 2022 income per person shrank by almost a fifth. A third of Iranians now live below the government's poverty line of \$400 a month. Teachers typically earn less than

\$250 a month, a fraction of their salaries before the Islamic Revolution in 1979.

Tehran's streets are clean but little new is being built. The city looks more shabby, dour and fatigued than when your correspondent last visited six years ago. There are more beggars and fewer cranes. Most of the latter are stationary. The once-gridlocked traffic has thinned. North Tehran has plenty of stylish coffee bars, but customers carefully nurse their drinks.

Iran has the world's third-largest reserves of natural gas, yet it suffered a summer of blackouts. Power plants have taken to burning cheap, tarry oil instead of gas, hugely exacerbating already severe air pollution. Oil production, currently around 3.25m barrels a day (b/d), has never again come close to the 6m b/d achieved under the shah in the late 1970s. Not a single economic target from the government's 20-year plan of 2005 has been met.

Six years of drought are intensifying the economic malaise. The reservoirs surrounding the capital are drying up. The peaks looming above Tehran are normally snow-capped. Yet when the haze lifts, now only barren rock is revealed. In Bushehr, a big southern port, the taps have already run dry. Masoud Pezeshkian, the president, has decreed that rice should be grown only in five provinces next year, not the usual 17. If the rains fail again, he said recently, he'd evacuate the capital—although his underlings quickly qualified his remarks.

The regime likes to blame the economy's problems on Western sanctions. But powerful interest groups within Iran benefit from its insularity and would resist any opening. Sanctions may make trade with Western countries hard, but it is the regime itself that is impeding imports from China with high tariffs. "They strengthen the internal market," exults Arsalan Ka-

zempour, the boss of a conglomerate which produces everything from cooking oil to paper. He says sales are growing by 40% a year. The IRGC, critically, runs a sprawling business empire and also operates lucrative smuggling rackets.

Many Iranians point to mismanagement and corruption as the root of the economy's difficulties. In front of billboards urging citizens to conserve water, sprinklers drench grass verges along the roadside. Fountains play merrily in country clubs frequented by the elite.

A steady simmer

Discontent is everywhere. Even though government minders accompany your correspondent all the time, Iranians of all stripes openly grumble about their rulers. In private officials echo such sentiments.

The regime is trying to repress dissent. "What are you doing here? You'll be arrested," a doctor hisses when your correspondent asks to chat. "I can't publish 80% of what I published when I started my career 25 years ago," the newspaper editor says. Her staff are regularly summoned for interrogation or arrested. Her last summons was the previous week. Fines and lawsuits have forced the paper to cut its print-run by half and to move to tiny offices.

The government has executed more than 1,000 people in the past year, the highest number since the 1980s. Human-rights groups report a spike in suspicious "suicides" in prisons. The authorities' paranoia appears to have become especially acute since the war revealed what detailed information Israel had about the regime's inner workings. According to some reports, more than 20,000 Iranians have been held for questioning since.

Despite this crackdown, however, public frustration erupts into protest periodically. Farmers agitate for help against desertification. Bakers, lorry drivers and nurses denounce dwindling subsidies. Students are among the most vocal: "IRGC—you are our ISIS," they chant at rallies. Elections, once an outlet for popular grievances, ring hollow. Turnout in Tehran in last year's presidential poll was just 11%.

The authorities seem to realise that they have to pick their battles. There is little emphasis on public piety. In a week in Tehran your correspondent saw only one cleric on the streets. The call to prayer is relatively muted. A government propaganda tour stops at a gleaming new mall, not a shrine. "We're the most secular country in the world," insists a surgeon.

In particular, the government seems to have abandoned its fight to force women to wear the *hijab*. The relevant laws remain on the books, but the morality police who used to enforce them have vanished. Except at government offices and events, women's bare heads are now the norm. ►►



Of arms and the holy man



Not what it used to be

- ▶ North Tehran's streets resemble a catwalk. Even senior officials do not always bother to maintain appearances: a leaked video from the lavish wedding of the daughter of Ali Shamkhani, an adviser to the regime's supreme leader, Ayatollah Ali Khamenei, shows her unveiled and in a low-cut dress.

There is a sense that the regime is wavering in its convictions. It has plastered the capital with portraits of pre-Islamic heroes in an attempt to drum up national pride. A statue of an ancient Persian king receiving homage from a Roman emperor has been erected in Islamic Revolution Square. The celebration of Iran's pre-Islamic history is redolent of the shah's regime and would have been anathema in the early days of the revolution. "The old story isn't working," says the nervous doctor, after ducking into a café where all the women are unveiled. "We're becoming a republic, not an Islamic republic."

Anti-Americanism is also fading. Diplomats imply they are almost friendly with their American counterparts. Mr Araghchi refers to Steve Witkoff, Mr Trump's main foreign-policy envoy, as "Steve". Even a guide at the former American embassy, today a museum cataloguing America's sins, says the students who seized the building in 1979 and held its occupants hostage now admit the takeover was a mistake.

Clerical error

Although the war did briefly seem to bring Iranians together, fissures are already visible again. The IRGC seized on the fighting as a chance to increase its own authority, a move Mr Khamenei made easier by spending the war hiding in a bunker with minimal communication with the outside world. Even though the clerics are supposed to command the army, rather than the other way round, the generals killed at

the start of the war have been buried reverently in the forecourts of local mosques.

The battle between Iran's hawks and doves has also resumed. The hardliners argue that America has proved time and again that it is not trustworthy. In 2015, after all, Iran signed a nuclear deal with America, only for Mr Trump to renounce it when he became president a year later and impose strict sanctions. Mr Araghchi was

busy haggling with "Steve" even as America signed off on Israel's surprise attack this summer. From their bastion in the parliament, the hawks try to press their advantage. This month they impeached the doveish finance minister, Abdolnaser Hemmati. They will not necessarily scupper a deal with America, but will certainly resist an end to Iran's nuclear programme, an invitation for Mr Trump, or anything that smacks of normalisation with Israel.

The factions within the regime are all awaiting an epochal event that cannot be far away. Mr Khamenei is 86. He is partially paralysed and increasingly frail. He is said to have drawn up a shortlist of possible successors. His son, Mojtaba—who has long been tipped as a possible heir—is reportedly not on it. Even cynics blanch at the idea of the revolutionary regime that overthrew a monarchy reverting to dynastic rule. Top posts in Iran often go to relatively obscure figures, buoyed by the support of different factions. Financial interests are likely to loom as large as ideological differences in the scramble for power.

What all this jockeying and intrigue will yield, whether in terms of talks with America or domestic reforms, is hard to predict. Many in Israel suspect the regime is simply awaiting the opportunity to revert to its past behaviour (see box). But the flux in Tehran suggests it might be willing to reinvent itself to survive. ■

The view from Israel

A respite, not a reset

JERUSALEM

Many Israelis believe another war with Iran is coming soon

"IRAN SIMPLY can't allow this impression to linger that we've been ahead of them every step of the way," says an officer in an Israeli intelligence service. "They have to show that they can take us by surprise as well."

There are two schools of thought among Israel's Iran-watchers. Some, like the intelligence officer, believe that the Islamic Republic will soon try to regain some of its lost standing in the region after two years of humiliation by launching some sort of surprise attack on Israel. Others argue that the regime is focused on self-preservation and on trying to rebuild the military capabilities destroyed during its disastrous 12-day air-war with Israel in June. But both schools agree that the regime is likely to seek retribution. The question is only whether it will come sooner or later.

Raz Zimtt of the Institute for Nation-

al Security Studies in Tel Aviv says Iran is already trying to rearm Hizbullah, a Lebanese militia which Israel has pumelled over the past two years. The Israel Defence Forces (IDF) are worried that Iran may start getting proxies in Iraq to launch missiles at Israel, much as Hizbullah used to do from Lebanon. Another fear is of a terrorist attack on an Israeli embassy or another such target.

By using proxies of one sort or another, all these forms of retaliation would be intended to make it more awkward for Israel to attack Iran directly in response. But the two schools of Iran analysts also agree that this stratagem would not work: Israeli reprisals would be swift, severe and aimed at Iran itself. That likelihood, of course, is a compelling reason for Iran's leaders not to risk it, especially when they are already beset by so many problems at home.

United States



MAGA and AI

Silicon Valley Forge

WASHINGTON, DC

A user's guide to the battle between techno-optimists and neo-Luddites

IN THE WORLD according to the “War Room”, a podcast hosted by Steve Bannon, a former White House strategist, woke liberals and shadowy globalists are out to get America. But in recent months the show has drawn a new battle line. Artificial intelligence (AI), Mr Bannon warned in a recent episode, would soon engender “the most fundamental, radical transformation” in human history. “It must be stopped, slowed down and put in the control of humans and not the four horsemen of the apocalypse.” Those horsemen, Mr Bannon says, are the chief executives of America’s leading AI firms. This is the most visible split between two irreconcilable factions within MAGA: secular techno-libertarians and religious paleo-conservatives. And, given the valuations of the AI economy, its promises and pitfalls, it may be the most consequential one.

Some of Silicon Valley’s AI elite has indeed cosied-up to the president. For his

part, Mr Trump appears taken by the technology. (“We should change the name...it’s not artificial, it’s pure genius.”) His AI Action Plan, issued in the summer, called for deregulation to unleash “global AI dominance,” delighting MAGA accelerationists.

The MAGA decelerationist wing has two kinds of objection. The first is practical. Marjorie Taylor Greene, a congresswoman from Georgia and, until recently, a staunch Trump loyalist, warns that AI will

lead to mass unemployment among working-class Americans. Others fret about children and teens being caught in manipulative, sometimes even erotic, relationships with large language models. Angela Paxton, a Trumpy Republican state senator from Texas who helped pass a state ban on using AI to create sexually explicit content that features children, says she broadly supports AI experimentation. “I just draw the line when it comes to beta testing on our children.”

The second set of concerns is more spiritual. According to Mr Bannon, big tech is using AI to create a system of “techno-feudalism” in which average Americans would be reduced to “digital serfs”. Josh Hawley, a Republican senator from Missouri, rails against what he calls “transhumanism”, a purported belief among the tech elite that humans should use AI to enhance their physical and cognitive abilities. “Americanism and the transhumanist revolution cannot coexist,” he warned at a conservative gabfest earlier this year. In this account, AI threatens not just work but the soul: it will make some men richer while impoverishing mankind.

These two factions are clashing over a more prosaic question: whether states should regulate AI. In the absence of a federal framework, many states have started passing their own laws. That is anathema ►►

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► to the accelerationists, who are better-funded than the Luddite wing. Their main objective is to secure passage of federal legislation that pauses states' rights to regulate AI. A similar law, which would have imposed a ten-year moratorium on state-level AI laws, failed in the Senate in July. On November 19th the Trump administration considered imposing an executive order that would quash state regulation on AI. They want to get ahead of a New York law which seeks to regulate large language models, following the passage of a similar law in California in September.

Many state-level MAGA-ites, such as Ron DeSantis, governor of Florida, opposed the move, stressing that stripping states of the right to regulate AI would let big-tech firms run rampant. Meanwhile within the White House, David Sacks, Mr Trump's "AI and Crypto Czar", who is also a Silicon Valley venture capitalist, has railed against what he claims are 1,000 bills introduced across all 50 states to regulate AI. He considers them part of a "doomer-industrial complex" that he believes will hamper America's ability to compete in the race for AI supremacy against China. He supports a moratorium on state AI bills.

Mr Trump has taken Mr Sacks's side, for now, arguing for "one federal standard instead of a patchwork of 50 state regulatory regimes". It is not clear, though, what the White House believes such a federal standard should contain. Mr Sacks appears to be most concerned about regulating AI to prevent left-wing bias in LLMs, or what he calls "woke AI". Some in the tech industry suspect that is merely cover for minimal regulation. Mr Sacks's MAGA opponents are suspicious of his motives. "The president is not well served by those folks," says Brendan Steinhauser, a veteran Republican strategist campaigning for states' rights on regulation. "They've been able to insert themselves in the White House...to get richer and more powerful."

Outside the White House, prominent venture capitalists and MAGA donors such as Marc Andreessen, of Andreessen Horowitz, a venture-capital firm, and techies such as Greg Brockman, co-founder of OpenAI, have thrown their weight behind "Leading the Future", a super PAC with more than \$100m in funding that is lobbying against state-by-state AI regulations. A new \$10m initiative from the America First Policy Institute, a group with deep ties to the Trump team, is trying to ease divisions within MAGA by developing policies that would support workers affected by AI.

One representative of a tech-lobbying organisation says forcing AI firms to navigate contradictory state laws would be like "tying our own shoelaces together", or worse still, would make America like the EU. He says there are lessons to be learned from the early days of the internet, which

was given a tailwind from having federal, rather than state-by-state, regulations. He says there are sufficient statutes on states' books covering consumer rights, child safety, fraud and cybersecurity to cover AI crimes, without creating new ones.

Yet the light-touch approach to the early internet is no longer universally accepted as a model to follow. Though big tech firms unsurprisingly say a single federal law would be better for them, some will also admit that the utopianism of the 1990s and 2000s was mistaken, and this has changed the politics of regulating tech. The same goes for many conservatives. "Because of the last several decades...the trust reservoir is depleted," says Wes Hodges of the Heritage Foundation, another MAGA think-tank. And the split over state regulations also pits lots of people within MAGA against federalism—another reminder that many of them were not very conservative in the first place. ■

Washington

Quies custodiet

WASHINGTON, DC

A shooting prefigures more ferocious immigration policies

FOR MONTHS National Guard troops in America's capital have been on "presence patrol". This is a fancy way of saying they have been taking walks with an eye to deterring crime. Their message to the city's residents has been that the streets are safe. A shooting on November 26th, blocks from the White House, dispelled that idea—and the notion that Washington's tourists and officegoers are the ones



Targets

who need protecting. Two Guard members were themselves the target.

The soldiers were critically injured and hospitalised. The alleged attacker was shot, not fatally, by another Guard member. Donald Trump called it an "act of terror" and promised that the "animal" responsible would pay the "steepest possible price". Officials named the suspect as Rahmanullah Lakanwal, a 29-year-old Afghan.

He is said to have arrived in 2021 aboard an evacuation flight after the Taliban takeover of Kabul. He—along with more than 70,000 other Afghans—received a temporary right to remain through a programme authorised by Joe Biden. The Biden administration offered similar schemes to Cubans, Haitians, Nicaraguans, Venezuelans and Ukrainians. Mr Trump ended most of them months ago.

Speaking after the shooting, the president called the arrival of "unvetted foreigners" the "single-greatest national-security threat" facing America. Mr Trump said he will "re-examine every single alien who has entered our country from Afghanistan under Biden" and "ensure the removal of any alien from any country who does not belong here".

The shooting will have consequences for Mr Trump's use of the National Guard in DC, and perhaps elsewhere. A federal judge recently ruled that their deployment in the capital was illegal, though she paused her decision until December 11th to allow for appeals. Already the Trump administration has cited the attack in its legal filings. Meanwhile the Supreme Court is weighing a separate case about whether to let the Guard deploy to Chicago. This could affect its calculus, too.

And the shooting will give yet more impetus to Mr Trump's immigration clamp-down. Within hours the agency in charge of visa processing had halted all requests from Afghans. Mr Trump has cited crime by foreign-born residents as a basis for restrictions before. In June, in Boulder, Colorado, an Egyptian man whose visa had expired firebombed a pro-Israel demonstration. Days later Mr Trump imposed limits on travellers from 19 countries.

No mention is made of the fact that immigrants are less likely to commit crimes than native-born Americans. Extremist violence on their part is vanishingly rare—a testament to America's skill at vetting and assimilating newcomers. Yet Mr Trump dislikes immigration, and talking it up as a security threat gives him more excuse to restrict it. Courts tend to defer to the president in matters of national security.

As for the politics of the shooting itself, some of Mr Trump's critics said it was the inevitable price of his performative use of the Guard. MAGA called it evidence of the capital's crime problem, and the president called up 500 more guardsmen to DC. ■

Healing

Medicine show

SANTA FE

The federal government will now pay for traditional Native American medicine

CAROLYN MORRIS flicks through a bulky folder in her office in To'Hajiilee, New Mexico. The clinical psychologist has filled it with the sorts of billing, evaluation and note-taking procedures that are now typical of American medicine. But they are all tailored for Native American healing rituals, like sweat lodges, a type of steam bath, and smudging, burning herbs. "I'm trying to design a way for a traditional healer to organise their thoughts," Dr Morris, who is herself Navajo, explains. This bureaucracy is necessary because in some states traditional healing is now covered by Medicaid, the federal health programme for the poor. She has taken on the red tape for the Cañoncito Band of Navajos Health Centre, just west of Albuquerque.

The change is not some bizarre Make America Healthy Again initiative, but the result of an experiment approved in the final months of the Biden administration. The states affected are Arizona, California, New Mexico and Oregon, which contain just over a quarter of Native Americans. Advocates hope that expanded traditional healing could help more people seek and remain in treatment. Native Americans are some of the sickest people in the nation, with life expectancy eight years behind the average. "It's a huge deal," which took over a decade to achieve, says A.C. Locklear, who leads the National Indian Health Board, a jubilant advocacy group.

Individual tribes can pick what healing

is included and who is qualified to do it. To get the care paid for, people must both be enrolled in Medicaid, meaning they earn less than around \$21,000, and be a member of a federally recognised tribe or a close family member of someone who is (additionally, California will currently cover only those in treatment for addiction). About a quarter of working-age Native Americans are on Medicaid and—unlike the Indian Health Service, which provides health care on reservations—it has open-ended funding.

Traditional healing "helps [patients] cleanse their mind", says Sarah Bitsui, who works at the same clinic near Albuquerque. "The smell of the smudging of the herb, the prayers and the healing songs, it helps them get back on the right track." It is particularly powerful for patients struggling with mental health problems or addiction, she argues (alcohol death rates are five times higher for Indians than among white Americans.) It can also draw people to a clinic and meetings with mainstream doctors. "The evidence showing the positive impact of traditional practices on health is emerging. It's fairly new," says Damian Chase-Begay of the University of Montana. "But it is steadily growing." He points to his own research showing that Native Americans who value traditional healing are half as likely to use alcohol and drugs. The Medicaid pilots will give researchers a chance to conduct more research.

Depending on the state, the money for traditional healing is only authorised for two to five years. But advocates are optimistic that Robert F. Kennedy Jr, the health secretary and himself a supporter of what is politely called nontraditional medicine, could keep it going. Mr Chase-Begay, the academic, hopes that bringing traditional healing into federal funding could help preserve ancient rituals, too. ■

Chicago's budget

Second city broke

CHICAGO

Chicago faces a crippling budget crisis

THE FESTIVE season is a time for physical post. Party invitations, presents, Christmas cards all arrive en masse through letter boxes. In Chicago this year there is a less welcome delivery too. Starting on November 14th, Cook County, which contains the city, started sending out its latest tax assessments to 1.8m property owners. This year, the average residential property bill has gone up by 17%.

The spike in tax bills has been long-expected. It is not that overall taxes have increased that much. Rather, for the first time property taxes now reflect changes in relative values since the covid-19 pandemic. Many downtown office buildings remain empty, and so their valuations have gone down. Property taxes target a total take, so this means taxes on residential properties automatically go up. The spike goes some way to explaining why Chicago is in a giant fiscal pickle. The Windy City may be a leading indicator of some of the problems many American metropolises will soon face.

The immediate problem for Chicago is a fiscal impasse. By the end of the year, by law, the city council and mayor must agree to pass a balanced budget. This year, thanks to the final winding down of pandemic-related federal support, the city has a \$1.2bn deficit, equivalent to a fifth of the city's operating budget (which it calls the corporate fund). What the city council and mayor Brandon Johnson agree on is that homeowners will not shoulder any further increase in the property tax (the bulk of which actually goes to the separate school district rather than the city, which is the other reason bills have risen so much). Otherwise they are on opposite sides.

There are really only two options: raise taxes or cut spending. Mr Johnson, a leftist who rose from obscurity to high office in 2023, does not want to make any cuts. Instead, he wants to reintroduce a \$21 per employee monthly "head tax" on any business employing more than 100 workers, and to substantially raise a sales tax on services like software paid mostly by businesses. The mayor says that he is asking "large corporations and the ultra-wealthy to chip in more". The teachers' union, his principal backer, says that this amounts to "the most transformative budget to come out of City Hall in generations".

The problem for the mayor is that not many people are inclined to give him what ►►



Bill the Feds

► he wants. A generation ago, Chicago's mayors could usually bully aldermen (city council members) to adopt whatever they proposed. Under the two Richard Daleys, a particularly imperious father-and-son pair, budgets often passed unanimously. Mr Johnson, however, is incredibly unpopular. Businesses hate the proposals, as does J.B Pritzker, the governor of Illinois, who is about as powerful in Illinois these days as Mayor Daley *père* once was.

On November 17th the city council finance committee voted down the mayor's proposals 25 to ten. "We are concerned about the terrible signal it sends to people who create jobs," says Bill Conway, an alderman whose district covers much of downtown. He says Mr Johnson should instead come up with spending reductions. He points to a study commissioned from Ernst & Young, a consultancy firm, which proposes substantial savings by improving matters like procurement, which the mayor has mostly ignored.

The problem with the tax proposals is not so much that they would be that punishing initially, says David Greising, the boss of the Better Government Association, a watchdog. Rather it is the principle. The risk is that mayors come to rely on squeezing business a little more to fill the deficit each year. In future the city's fiscal problems seem only likely to worsen. Already, some 40% of the total budget goes on paying debt and pension costs. For decades the city has filled its deficits with absurdly short-termist patches. In 2008 the second mayor Daley sold a 75-year lease on the city's parking meters. But those sorts of options are running out.

And the bond market is fearful. On November 19th a bond issuance by the city, intended to refinance old debt, fell \$75m short of its target. Even though the bonds issued are secured by sales-tax revenues, those that were sold did so at a higher interest rate than New York City pays on unsecured debt. If the city's credit is downgraded, the cost of refinancing its long-term debt will rise, putting all the more pressure on future budgets.

Big cities all over America are facing similar challenges to Chicago's, albeit not yet on the same scale. In New York, the mayor-to-be, Zohran Mamdani, has made large spending promises that he hopes will be paid for by tax increases that Kathy Hochul, the governor of the state, opposes. If he does not get them, he is more likely to have to make cuts than make buses free. In Los Angeles the city made a deal with unions in September to fill a yawning budget gap. President Donald Trump's unilateral spending freezes are hitting city budgets even as lower immigration means populations—and the tax base—may start shrinking. The gusts chilling the Windy City now may be about to blow elsewhere. ■

The Golden State

Eureka!

JAMESTOWN

The high gold price is luring more miners to the mountains

HOLD THE pan with two hands, explains "Nugget" Nick Prebalick. Then swish the dirt around. It's a balmy day in Jamestown, in the foothills of California's Sierra Nevada mountains, and the second-generation miner is teaching your correspondent how to pan for gold. Dunk the pan three times, he continues, then repeat the whole process. Slowly but surely the rocks and sand wash away and leave behind a golden pebble about half the size of a pinky nail. "That's a big piece!" says Mr Prebalick. He reckons it's worth \$20.

The gold price hit a record \$4,380 an ounce on October 20th. It has since wobbled a bit, but is still around 55% higher than it was this time last year (see chart). Some analysts think gold could fetch \$5,000 an ounce next year. Tourists, pensioners and treasure-seekers have flocked to the hills. Ten years ago Mr Prebalick could make about \$30,000 a year showing people how to pan for gold. These days he says he is raking in more than \$100,000. Prospecting clubs are growing. Marty Paulsen, the president of Temecula Valley Prospectors in southern California, says new people show up to every monthly meeting. "How many of you joined the club to get rich?" he recalls asking. "Maybe eight or ten people raised their hands."

The high price isn't the only reason for this new gold rush. In recent years California has been buffeted by strong winter storms, which loosened gold deposits in the mountains. When the snow melts in the spring, nuggets and



Always believing

flakes tumble through rivers and lodge in creek beds, where a lucky miner may find them. Finally, spend time with a gold miner and they will mention the Discovery Channel's "Gold Rush" reality show. The programme, now in its 16th season, follows rival mining crews in the Yukon in their quest to "get sluicy goosey for the tiny shiny".

The high price, wet weather and reality fame have brought new life to California's old mining towns, which depend on gold tourism. Columbia, one such town, is home to the Church of the 49ers, "Where God is the gold!" Drive around and you might spy Mother Lode Septic Services, Mother Lode Gun Club, and Mother Lode Dance Academy.

When gold was first found in 1848 eastern elites looked down on the riff-raff who went west, and the brawling boomtowns they built. "California", wrote Henry David Thoreau in 1852, "is only three thousand miles nearer to hell". Gold is still a risky business. Mr Prebalick patrols his property because trespassers try to steal the sparkly stuff. It is possible to hit the jackpot: Mr Prebalick says he and his father once found 127 ounces in one day. But historians of the gold rush and modern miners argue that the real money is made by selling equipment to gullible prospectors. Greed, it turns out, is a surer bet than gold.

You give me fever

Gold, \$'000 per troy ounce



Source: LSEG Workspace

Justice

Licence to kill

ATLANTA

How the Supreme Court ushered in a surge in executions

AT TWILIGHT NEARLY four-dozen churchgoers from Our Lady of Lourdes in Daytona Beach shuffled off a bus onto a sun-bleached field facing the Florida State Prison. They had come to pray while Malik Abdul-Sajjad was being executed for the 1988 murder of a convenience-store clerk. They stood under a sign carved with the word “opponents” until the vans carrying execution witnesses drove away, signalling the man had been killed. Each time the state puts someone to death, the caravan makes the two-hour drive up the coast. Last year they came once. This year they have come 17 times.

By the end of December America will have executed 47 people, nearly double last year’s tally and the highest in almost two decades. Florida, which is on track for its deadliest year on record by far, is responsible for most of the surge (see chart 1). But a handful of southern states that for years had paused executions have also resumed. Nationally, the number of people put to death remains far below the peak in the nineties. The long decline since then, however, appears to be reversing.

One might expect the sudden killing spree to reflect the country’s mood, but it comes as support for capital punishment hits a 50-year low (though 52% of Americans still support it). Jurors have soured on it: since 1996, the number of new death sentences in America has fallen steeply (see chart 2). Lawyers reckon that the public is waking up to the fact that there is no evidence that capital punishment deters crime, and that historically states have not been very good at sentencing the right people. Since 1973, 201 death-row inmates have been exonerated. “There is a widespread realisation that we don’t need the death penalty and that the justifications for it are completely faulty,” says Cliff Sloan of Georgetown University.

Why then are states pressing ahead? The choice usually lies with a few powerful people—some of whom still seem to think killing is good politics. Ron DeSantis, Florida’s lame-duck governor with higher-office ambitions, ramped up executions while running for president, then paused them once he dropped out. In Oklahoma an elected judge refused the Department of Corrections’s plea to slow the rapid pace of executions to avoid officer burnout and told them to “man up” (he was overruled). Tough-on-crime pressure is coming from

the top: when Donald Trump took office, he urged states to clear their death rows.

The biggest shift, however, comes from the Supreme Court. A decade ago the court would routinely block states from executing people without solid evidence or in torturous ways, at the eleventh hour. In 2019 a more conservative bench appointed by Mr Trump changed course. In *Bucklew v Prekythe*, it raised the bar for what counts as cruel and unusual punishment—allowing states to test new methods beyond lethal injection—and said that “last-minute stays should be the extreme exception, not the norm.” The next year, Mr Trump presided over the executions of 13 people in the final six months of his first term, the first bout of federal executions in 17 years.

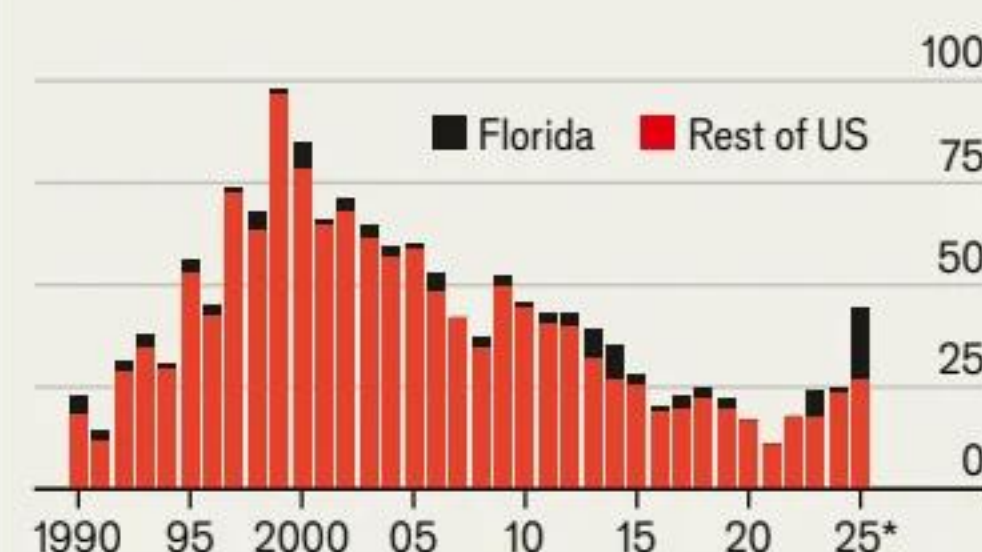
Bryan Stevenson, who runs the Equal Justice Initiative in Alabama, reckons that the court’s retreat from policing the death penalty has emboldened states to pursue executions they once wouldn’t have and to be more “experimental” in how they kill. This year the justices haven’t paused a single execution, according to the Death Penalty Information Centre. Nor have they intervened in cases of obvious suffering. In May a three-officer firing squad in South Carolina missed a man’s heart, leaving him to die slowly, and in October an Alabama inmate thrashed for 40 minutes as he suffocated from nitrogen gas—a fate he had petitioned the court to spare him from.

Philip Egitto, the pastor of the Catholic

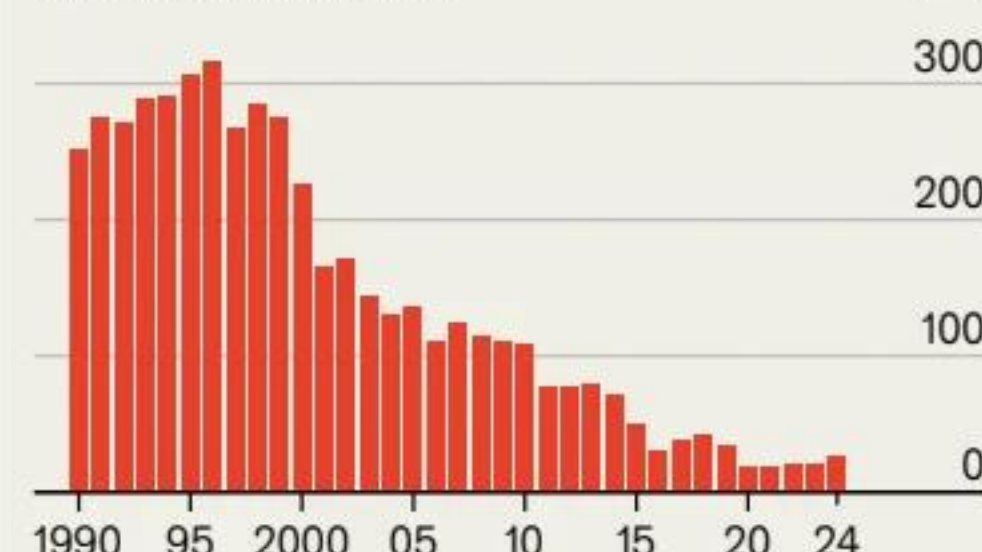
Legal injection

United States

Executions



New death sentences



Source: Death Penalty Information Centre *To November 20th

caravan, has noticed the change from outside the prison. Years ago they would wait for hours as the courts debated whether the man in the death chamber deserved another hearing. “Now our governor has it down like clockwork, it always starts sharply at six o’clock,” he says. Florida isn’t just taking advantage of the court’s retreat, it is testing it. In 1977 the justices banned the death penalty for rapists, and in 2008 they clarified that applied even for a child rape. This month Florida’s attorney-general said he would seek it for a nanny who molested children. His aim in bringing the unconstitutional charge, he explained, is to get the court to overturn precedent and allow the state to do more killing. ■

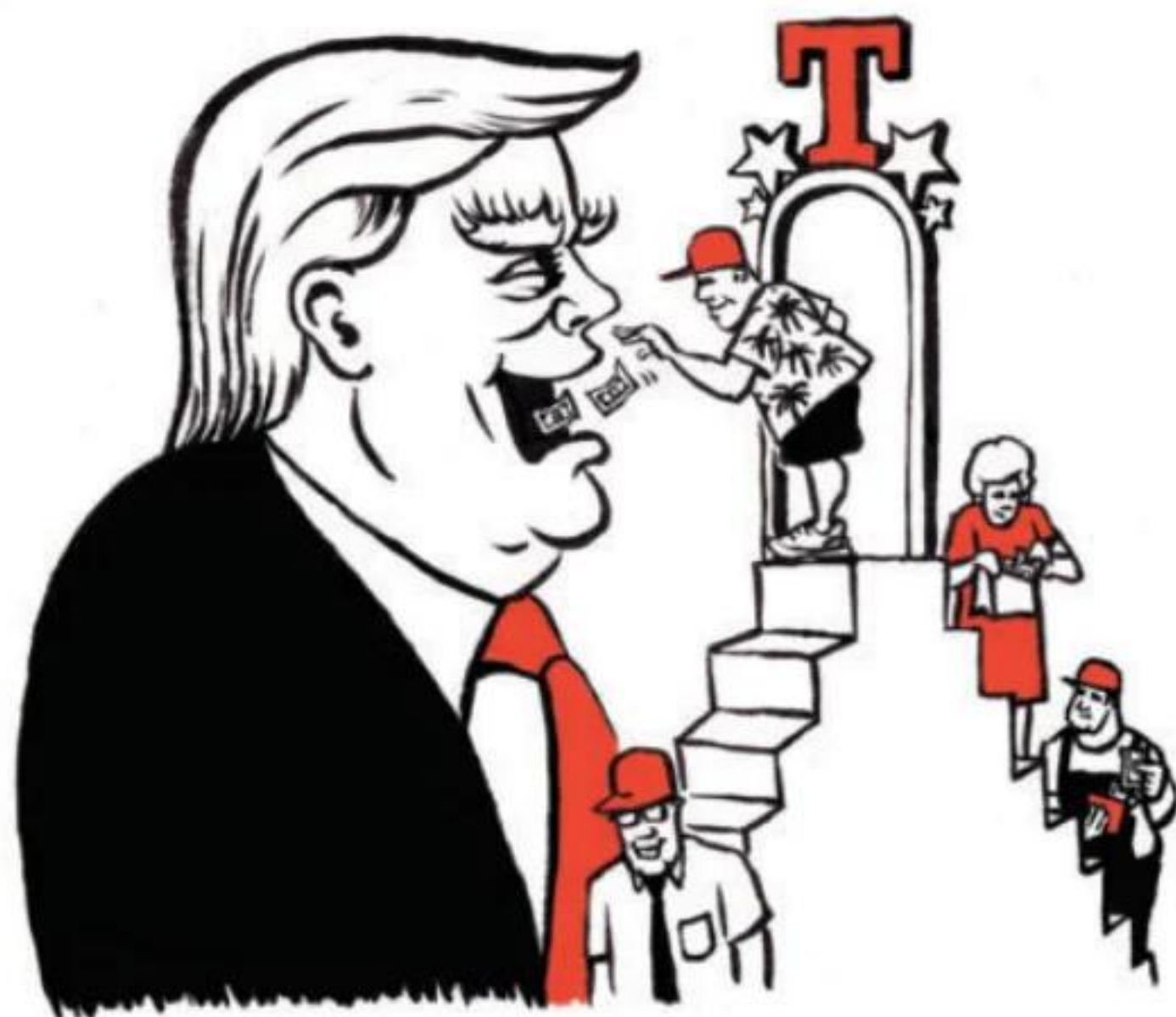


Conscientious objectors

LEXINGTON

Going platinum

How Donald Trump raises money from his fervent supporters



THE INVITATION to join President Donald Trump's cabinet would have come as a shock if Lexington had not already been honoured with so many generous proposals from the man: to be a White House Adviser, to join the Trump Inner Circle and the Trump Executive Board, and to become a member of the Trump Gold, Diamond and Platinum Clubs along with the Anti-Antifa Club. "J.D. Vance and I were just talking about you," he emailed one day, with the offer of a seat on the Trump Advisory Board. All the president was asking in return, besides sage counsel, was a donation of as little as \$25 to his political action committee (PAC).

Mr Trump has been raising huge sums from billionaires and corporations for an ever-lengthening list of initiatives, from his triumphal arch in Washington to his efforts to retain majorities in Congress. But he has also continued imploring his less wealthy supporters, sometimes several times a day, to chip in to finance his core political operation via "Never Surrender", a PAC created this year to replace a similar fundraising vessel that served his campaign in 2024.

For students of Mr Trump's politics, his small-dollar appeals have particular value. Together, the hundreds of proposals and pleas Mr Trump has emailed to his most passionate supporters compose the MAGA narrative of his second term. They illuminate his movement's priorities, mood swings and taste, at least as Mr Trump and his team understand them, and surely no one understands them better. It is a tale of triumph and yet constant peril, for the story, often rendered in all-caps, is a melodrama, and the emails are soaked in emotion.

As the tantalising prospect in the spring of "\$5,000 DOGE DIVIDEND CHECKS!" gave way in the autumn to that of "\$2,000 TARIFF REBATE CHECKS!" the tale was interesting as well for what it ignored: for example, almost anything to do with foreign policy. Mr Trump has clearly relished his royal treatment in foreign capitals and such bold strokes abroad as bombing Iran. But he did not mention them in soliciting his base. Instead, prominent issues in this chronicle include changing the name of the Gulf of Mexico to the Gulf of America, resisting communism and deporting undocumented migrants. In a clue to the demography of his small do-

nors, the achievement Mr Trump probably cites most, with trademark overstatement, is "NO TAXES ON SOCIAL SECURITY!"

The president's victories are perpetually menaced by "Radical Left Lunatics, also known as The Democrat Party" and by "unelected radicals in the courts". Mr Trump urgently needs money to stop the Democrats from impeaching him again and from giving free health care and the vote to "illegal aliens". A rare email touching on foreign affairs emphasised how Democrats who "HATE our country" are "CONSPIRING WITH CHINA".

Whoever may be writing these messages, their sensibility is impressively Trumpian—conversational and even familiar (particularly after the IT team fixed an apparent bug that rendered the recipient's first name as "your name"). The result is a simulacrum of the intimacy accorded to those who can afford to attend a fundraiser in the real world. Mr Trump often assures the recipient that he loves him. "You were on my mind the other day," read one subject line. In an oft-repeated solicitation Mr Trump recalls being shot and wounded, saying God saved him to make America great. The Trumpian wit is frequently on display. "I love the smell of deportations in the morning," he wrote.

And, very often, along with memberships and honours, there is stuff to be had: signed golf balls, gold golf balls, a chance at one of 1,500 "very limited edition" replicas of the "Gulf of America" executive order (curiously, the same limited number was on offer again two weeks later). Sometimes, the offer is of a possible offer: recipients are periodically asked to vote on whether they would prefer the chance of a motorcade ride to Trump Tower or a "Trump Force One" flight to Mar-a-Lago. The pressure can be intense. Lexington was alerted many times he had just six hours left to join the Platinum Club, until one day he was informed the membership he had never purchased was about to expire.

[Your name]

By Mr Trump's fundraising standards, Never Surrender is small beer. It had about \$38.5m in cash on hand as of June 30th, the end of the last reporting period, compared with \$196m held by his super PAC, MAGA Inc. Though MAGA Inc can take donations in unlimited amounts, Never Surrender is subject to limits of \$5,000 annually per person, and it cannot take corporate money. This compliance with stricter federal standards means that, unlike with MAGA Inc, Mr Trump can direct the funds in Never Surrender to specific candidates. "It's particularly valuable in a political sense," says Trevor Potter, president of the Campaign Legal Centre, a non-profit. Yet, he notes, this more democratic, transparent fundraising comes with its own political cost: "It encourages and incentivises people to be extreme in at least their public persona, because that's what excites the base."

In politics as in business, Mr Trump has succeeded in part by testing the limits of American cynicism on the one hand, and American credulity on the other. His high-dollar fundraising capitalises on the former, while his email solicitations are so transparent in their exploitation of the latter as to recall how he once marvelled at patrons in one of his casinos: "Look at those losers," he remarked, according to "Confidence Man" by Maggie Haberman. Though, in fairness, Mr Trump can surprise with his attentiveness. As Thanksgiving approached, he emailed to say he had personally approved Lexington's application to the Platinum Club, though Lexington could not recall even making one. All the president needed in return was confirmation. And \$20.25. ■

The Americas



Politics in Brazil

Messiah no more

RIO DE JANEIRO

As Jair Bolsonaro is jailed, the Brazilian right is rudderless

ON NOVEMBER 25TH Jair Messias Bolsonaro, Brazil's hard-right former president, began a 27-year jail sentence for attempting a coup after losing his re-election bid in 2022. Brazil's Federal Supreme Court found Mr Bolsonaro guilty in September. His lawyers appealed, and asked that he serve his sentence under house arrest because of his medical condition. They failed. Mr Bolsonaro will be confined to a small room designed for high-ranking officials at the Federal Police headquarters in Brasília, the capital. He will have a TV, air-conditioner, en-suite bathroom and the right to a daily "sun bath".

Mr Bolsonaro's imprisonment marks the end of his drawn-out exit from politics. In 2023 he was barred from public office for eight years for abusing his powers and using state media to spread falsehoods about voting machines. Yet he insisted that he would appear on the ballot. Other right-wingers eager to compete in next year's

general election, which will be held in October, were stuck in his shadow. With less than a year to go until the vote, Brazil's right has no obvious leader. Infighting among potential candidates is growing.

The picture was very different just months ago. Approval ratings for President Luiz Inácio Lula da Silva, a left-wing stalwart serving his third term in office, were sinking (see chart on next page). Food inflation was stubbornly high, the left's social-media presence feeble. Many voters felt that Lula, as the president is known, was spending too much time on foreign trips and too little tackling bread-and-butter issues at home.

In many ways Mr Bolsonaro's own fam-

ily is to blame for the reversal in the right's fortunes. In March one of his sons, Eduardo, took leave from his job as a congressman in Brazil and moved to Texas to lobby Republicans to protect his father from prosecution. Donald Trump responded by imposing crippling tariffs of 50% on Brazilian imports, citing a "witch-hunt" against Mr Bolsonaro, as well as sanctions on the supreme court judge in charge of the case.

While Lula called the Bolsonaro family "traitors to the country", ambitious right-wingers were put in a bind. At pains to dissociate themselves from the unpopular tariffs, they also wanted to show support for Mr Bolsonaro: any right-wing candidate needs his blessing if they are to be competitive in the election. It didn't help that on September 7th, Brazil's independence day, thousands of Bolsonaro supporters marched through São Paulo under a gigantic American flag. "They gave Lula the slogan of sovereignty on a silver platter," says Camila Rocha of the Brazilian Centre for Analysis and Planning, a research institute.

Right-wing leaders tried to blame Lula for the tariffs, accusing him of being incapable of or uninterested in negotiating with Mr Trump. "Lula put his ideology above the economy, and this is the result," asserted Tarcísio de Freitas, the governor of São Paulo and a possible presidential contender. That narrative soon fell apart, »

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27 Drone warfare in Colombia

▶ as Mr Trump and Lula cosied up. After meeting briefly on the sidelines of the UN General Assembly in September, Mr Trump praised their “excellent chemistry”. On November 20th, in response to pressure at home, he removed most of the tariffs on many of Brazil’s exports to the United States, including staples such as coffee, beef and fruit. He appears to have all but forgotten Mr Bolsonaro.

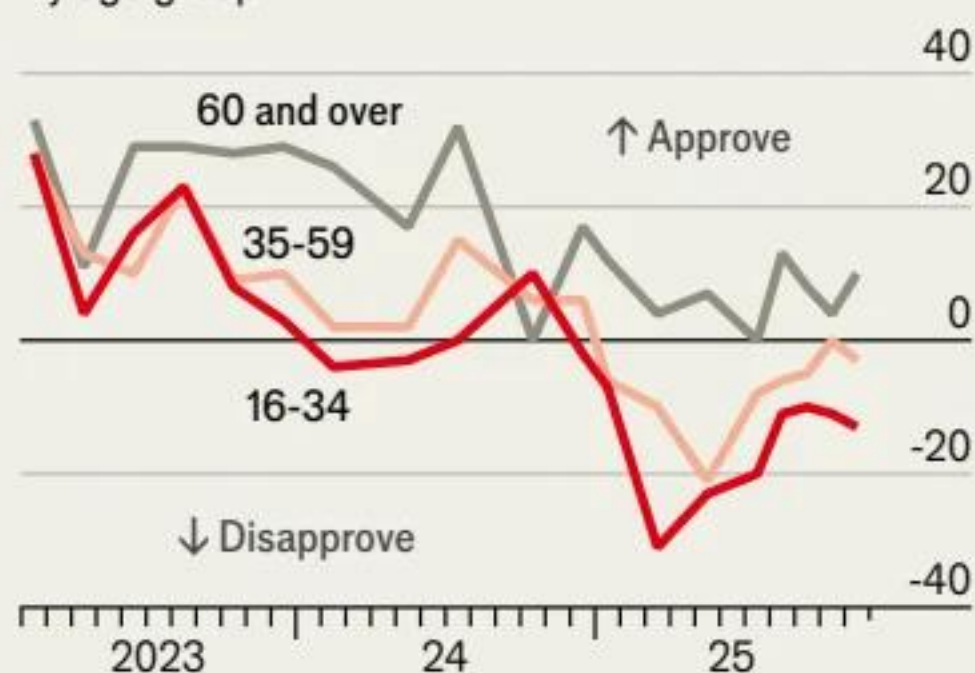
Eduardo’s rogue actions also led to an internecine spat. Brazilian investigators, who have charged him with attempting to interfere with Mr Bolsonaro’s trial, released text messages he sent his father in which he bad-mouthed Mr Freitas: “He has stood by with his arms crossed, watching you get screwed while he warms up for 2026.” In part because of the spat, Mr Freitas has been reluctant to run for the presidency, claiming instead that he will stand for re-election as governor, a safer bet. “The big problem for the next candidate is Bolsonaro’s sons,” says Gabriel Rezende, a political scientist in Rio de Janeiro. No one knows who they will support.

As the right split, Lula’s government found its mojo. On November 5th the Senate passed his headline campaign promise: a reform raising the threshold for income-tax exemptions from 3,036 reais (\$564) per month to 5,000, and lowering taxes for those earning up to 7,500. It will benefit some 16m Brazilians. Plans to increase taxes on rich Brazilians, fintechs and gambling firms would make the package revenue-neutral, but these are going nowhere.

The reforms are wildly popular with Brazilians and have forced right-wing legislators into contortions. “There’s nothing to celebrate,” claimed one deputy after the bill passed in the lower house and she had voted to support it. “Does anyone doubt that the price for this bill will be passed on [to consumers] in higher prices for products?” asked another, who also voted in favour. Ahead of the vote Lula’s new social-media team flooded Brazilians’ feeds with AI-generated videos lambasting “the BBBs: billionaires, banks and betting companies”.

The Bolsonaro bounce

Brazil, Lula’s government net approval rating, percentage points
By age group



Source: Genial/Quaest

In one, a wealthy patron gorges on lobster and champagne but insists on paying a lighter bill than his working-class co-diners, who have had simpler meals.

Since it is losing the argument on sovereignty, tariffs and taxes, the right is going for Lula’s weak spot: security. On October 28th a police raid on two favelas in Rio killed over 130 suspected gang members. Most Brazilians supported the raid, but Lula suggested that traffickers were themselves victims of drug users, sparking outrage. “The left has an incapacity or an inhibition against going after criminal organisations, with which it works,” says Ronaldo Caiado, a right-wing presidential hopeful and governor of Goiás, an agri-business-powerhouse state. (There is no evidence the left works with gangs.) He wants to label gangs as “narco-terrorists”, aping the Trump administration’s language.

Other candidates are also trying to bolster their crime-busting credentials. On November 17th Eduardo and his brother

Flávio Bolsonaro, a senator, visited El Salvador. Strongman president Nayib Bukele has thrown more than 1.5% of the population into jail as part of a crackdown on gangs; an astonishing 8% of all young men have been arrested. Days later Brazil’s lower house approved a bill introduced by a close ally of Mr Freitas that would increase prison sentences on gang members and make it easier to confiscate their assets.

Much could still go wrong for Lula. Most Brazilians think the 80-year-old should not run for office again. His income-tax reform could push up inflation by boosting consumption. If security deteriorates it could make him look soft on crime. Romeu Zema, another presidential hopeful who is the governor of Minas Gerais, says the left “depends totally on Lula”, while the fierce competition on the right “proves it is better at producing good leaders”. In the long run, that may be true. But for now the greatest beneficiary of Mr Bolsonaro’s chaotic legacy is Lula. ■

Justice in Canada

A very different prison

Canada’s healing lodges offer indigenous convicts an alternative to jail

WILLOW CREE Healing Lodge does not look like a prison. The men held there are not called “offenders” but *nîcisânak*, a Cree word for siblings. Their day usually starts with prayers and smudging, in which a spiritual adviser wafts smoke over inmates as an act of cleansing. Later they may study for a high-school diploma, learn to fight fires or attend a sweat-lodge ceremony.

This is one of ten such institutions in Canada. Healing lodges are alternatives to prison based on the practices and beliefs of Canada’s indigenous peoples, who have suffered centuries of discrimination, forced assimilation and abuse. They are far more likely to end up in prison than the average person. Five percent of Canadians describe themselves as indigenous, but they account for a third of the people in prison; in women’s prisons the figure is half.

The first healing lodge opened in 1995 as a way to rehabilitate indigenous prisoners. Unlike in rehabilitation-focused prisons elsewhere, the emphasis is on reconnecting with heritage. Elders counsel inmates and teach indigenous languages and history. They also lead spiritual ceremonies, dances and feasts. Each healing lodge reflects the traditions and style of its region. One in

Manitoba has a tipi-inspired design, whereas the one in British Columbia has a longhouse.

Indigenous men have the highest rates of recidivism of any group in Canada. Healing lodges are meant to help break this cycle. Men who go through them are half as likely to end up back in jail compared with similar offenders who do time in conventional prisons.

For prisoners to succeed after release, they need a job, family support and a sense of purpose, says Justin Tetrault of Simon Fraser University. The lodges work because they help inmates to learn to look after themselves, as well as professional skills. In a normal prison, inmates make few decisions for themselves. At a healing lodge, they prepare their own meals and do charity work. Healing lodges also help offenders make sense of their past. An elder, for example, might help an inmate forgive his mother’s mistakes by explaining the horrors of the residential school she was sent to.

Over the past decade, the number of indigenous prisoners has grown faster than the spaces available at healing lodges. Most have a long waiting list. In total, there are about 450 beds. That is enough for less than 10% of the indigenous people in lock-up.

Security in Colombia

Kamikaze craze

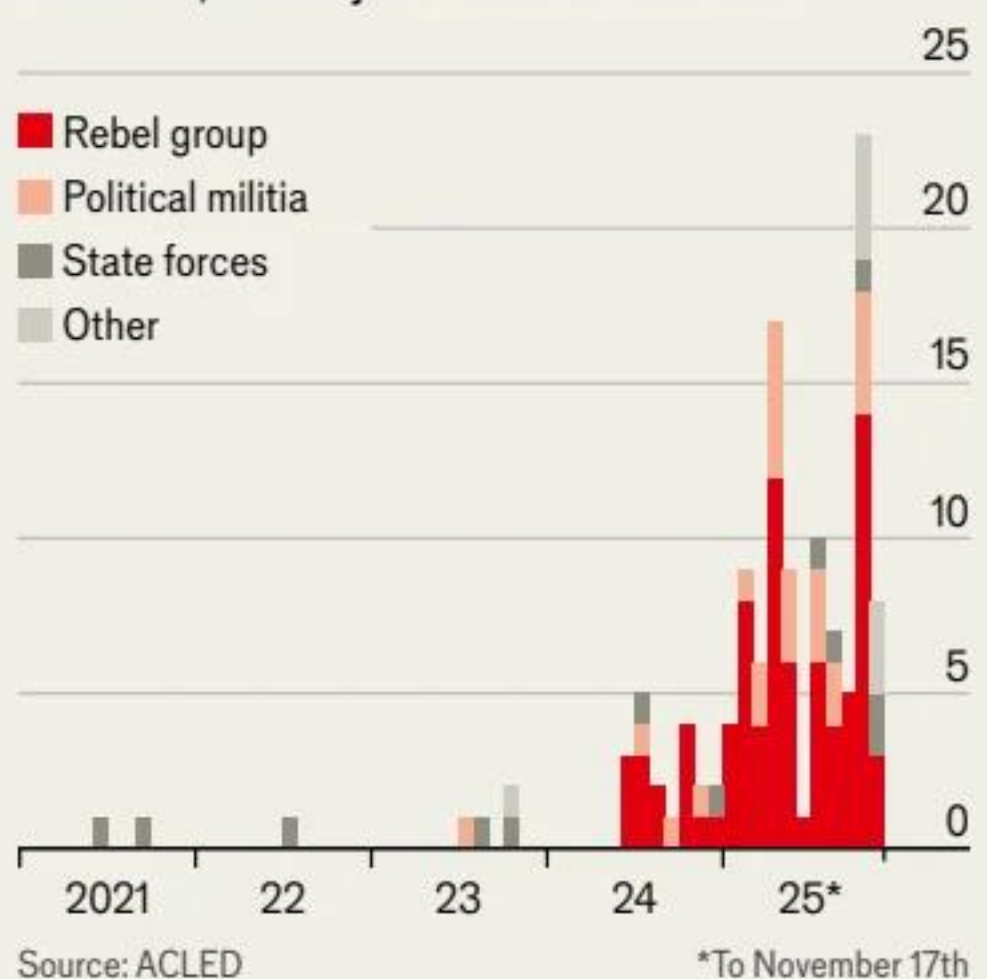
Colombia's armed groups are experimenting with deadly drones

DRONE WARFARE has come to Colombia. In recent months the country's security forces have been targeted with one drone strike after another by armed groups, consisting of roughly half a dozen drug gangs, and revolutionary militias that have been battling the government for more than 60 years. Soldiers on patrol, army bases, police stations and naval vessels have been hit. "The old guerrillas tried a thousand times to get missiles and never succeeded," said Humberto de la Calle, Colombia's former vice-president, after a wave of drone attacks this summer. "This has never happened before in Colombia."

Armed factions have been deploying drones for years. The Gulf Clan, a drug gang, was using them for smuggling in 2016. Two years later the National Liberation Army (ELN), a paramilitary group, began using them for surveillance. But the use of weaponised drones by gangs did not begin until 2023. Last year a ten-year-old boy was the first person in Colombia to be killed by a drone after it dropped a grenade on a football pitch. Attacks have risen sharply since then. Armed Conflict Location and Event Data (ACLED), a research group based in the United States, has recorded more than 80 drone attacks in Colombia by non-state groups since the start of the year, up from fewer than 20 in 2024. Air strikes from helicopters and planes, which are the preserve of Colombia's armed forces, are now vastly outnumbered by drone attacks.

Suddenly, drones

Colombia, monthly air and drone strikes



Colombia's armed groups were already on the front foot. Since his election in 2022 Gustavo Petro, Colombia's president, has pursued a policy of *paz total* (total peace), negotiating with nearly all the country's armed groups at once. But the policy has failed. The militias have used ceasefires to regroup, rearm and train with drones. Their ranks have swelled and they have seized territory.

In January the ELN launched an offensive in Catatumbo in the east of the country, where it has since carried out several drone attacks. Footage shows Colombian soldiers scattering when a mortar shell, dropped from above, explodes next to them. Cauca, a western province where gangs are fighting for access to the Pacific ocean, is another hotspot.

In July a faction of the Revolutionary Armed Forces of Colombia (FARC) hit a navy patrol boat with a first-person-view (FPV) drone, the kind that is piloted by an operator watching through its camera. The pilot flew it into the boat and the drone exploded, kamikaze-style. It was perhaps the

first deadly use of FPV drones in Colombia.

One reason for the rise in attacks is the availability of cheap commercial drones, mostly manufactured in China, which armed groups can modify to carry bombs. Another is the use of drones in the war in Ukraine. The appearance of videos from that conflict was a "watershed moment" which showed Latin American armed groups what could be achieved, says Henry Ziemer of the Centre for Strategic and International Studies, a think-tank in Washington. Thousands of Colombian fighters have joined the conflict in Ukraine as mercenaries; some are said to have enlisted in Ukraine's foreign legion to gain experience with drones. Gangsters in Mexico, who have also increased their use of drones, are thought to have done the same.

Colombian drone operators are much less skilful than Ukrainian ones. While "it's easy to get started using drones, it's harder to use them very effectively", as Mr Ziemer points out. According to ACLED's database, few of the strikes launched in Colombia actually succeed in killing one or more of their targets. Still, the armed forces are worried. Knowing that their enemies operate drones is enough to limit what the soldiers are willing to do. And drone use is probably still a long way from reaching its peak. As groups like the ELN and the Gulf Clan gain experience in using the devices, their ability to do serious damage with them is likely to improve.

The armed forces are beginning to fight back. This year a state-run aerospace firm developed the Dragom, Colombia's first domestically produced attack drone. In October the air force started its own drone unit. The government has also spent \$25m on American-made jamming equipment to defend army bases. It may deploy such kit to protect rallies and polling stations during next year's election.

It is not clear whether these measures will work. Unlike in Ukraine, where most of the fighting takes place along a fairly continuous front line, Colombia's armed groups are fighting for control of small areas of territory, spread out right across the country. That makes it hard to counter drones with jammers without disrupting civilian communications.

Clamping down on supply chains is another solution: the government is trying to tighten import restrictions and introduce a tougher permit system for drone ownership. But smuggling networks would probably be quick to adapt.

In the meantime, weaponised drones are spreading beyond Colombia. In September a drone attacked a prison in Guayaquil, Ecuador's biggest city. Last month gangs in Brazil used drones to launch grenades at police during a raid in Rio de Janeiro. Drone warfare has battered Colombia. It looks set to shake the region, too. ■



New weapons for a new war

Asia



Yogi Adityanath of Uttar Pradesh

Visionary or villain?



LUCKNOW

Meet the road-building, Muslim-baiting monk who could rule India

FOR MOST of his life he has been a monk, renouncing worldly possessions, wearing saffron and rising early to pray, meditate and feed sugary treats to cows at a temple in Gorakhpur where he is the head priest. For the past eight years he has also been one of the most powerful politicians in the world, ruling over an Indian state of 240m people. If it were a country, it would be the world's sixth-biggest.

Some people think Yogi Adityanath, the chief minister of Uttar Pradesh (UP), is a possible future prime minister of India. Others balk at the notion. At the very least, he represents an important strain in the country's politics: a muscular Hindu nationalism that lays a lot of asphalt. Businesses praise his efforts to build roads, pep up the electricity supply and crush crime. Critics accuse him of trampling on human rights and Muslims.

Though he seldom gives interviews to the foreign press, he met *The Economist* on

November 11th in Lucknow, the state capital, to talk about development. In a high-ceilinged audience room, flanked by Hindu icons and smiling disarmingly, he outlined his plans to create a \$1trn economy in UP by 2029.

That is impossible, barring a sudden collapse in the value of the dollar. The state's total output is around \$300bn; no large economy can treble in size in four years. Still, puffery aside, UP's recent growth story is impressive.

It started from a low base. Agrarian, landlocked, riven by caste and tortured by

gangsterism, it has long been one of India's poorest states, living off huge fiscal transfers from the centre, typically amounting to as much as it raised in tax. In the past 15 years, however, governance and growth have perked up. That process accelerated under Mr Adityanath, who has been chief minister since 2017. On his watch UP has grown at an annualised rate of 6.9% (excluding 2020-21, when the entire country was ravaged by covid). In the past three years it has grown faster than India as a whole. UP was "once regarded as a sick state", says Mr Adityanath. Now it is "one of India's economic growth engines".

What changed? The most visible factor is an infrastructure boom. Drive from Gorakhpur, where Mr Adityanath's temple sits, to Lucknow, the state capital, and you will enjoy miles of smooth, fast roads (see map on next page). The state has more than 12,000km of national highways, up from 8,500km in 2016, and 18 airports, up from six in 2017, though many still lack scheduled services.

As in much of India, villages have been connected with all-weather two-lane roads and reasonably reliable electricity. "Funding is not a constraint," says Mr Adityanath. As a popular chief minister belonging to the Bharatiya Janata Party (BJP), the Hindu-nationalist grouping that governs India, he has extracted money for big pro- ▶▶

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— Banyan is away

jects from the central government. He has also prioritised them himself: at 6.6%, state investment as a percentage of GDP was the highest in India last year.

All this has made UP an easier place to make money. According to the Economist Intelligence Unit, our sister company, the business environment has improved faster than in any other Indian state in the past five years. That is also thanks to other reforms, including to land and labour regulations. Arvind Panagariya, an economist, reckons better law and order has made the biggest difference. “When crime rates are high, investors are not going to come to your state,” he says. In the past, gangsters ran a land mafia, making it hard for firms to set up shop. Today, says Mr Panagariya, “some parts of UP don’t look like UP.”

That is certainly true of Noida, an IT and manufacturing hub dotted with skyscrapers and business parks. It is situated at UP’s western edge and, more relevantly, on the edge of Delhi. That gives it its two great strengths: access to a large, skilled workforce and a lot of vacant land near the national capital. Samsung, Xiaomi and Google have all moved in, lured in part by the incentives Noida can offer as a special economic zone. Metropolitan Noida is home to about 1% of UP’s population, but accounts for a tenth of its GDP and an outsize share of its tax revenues.

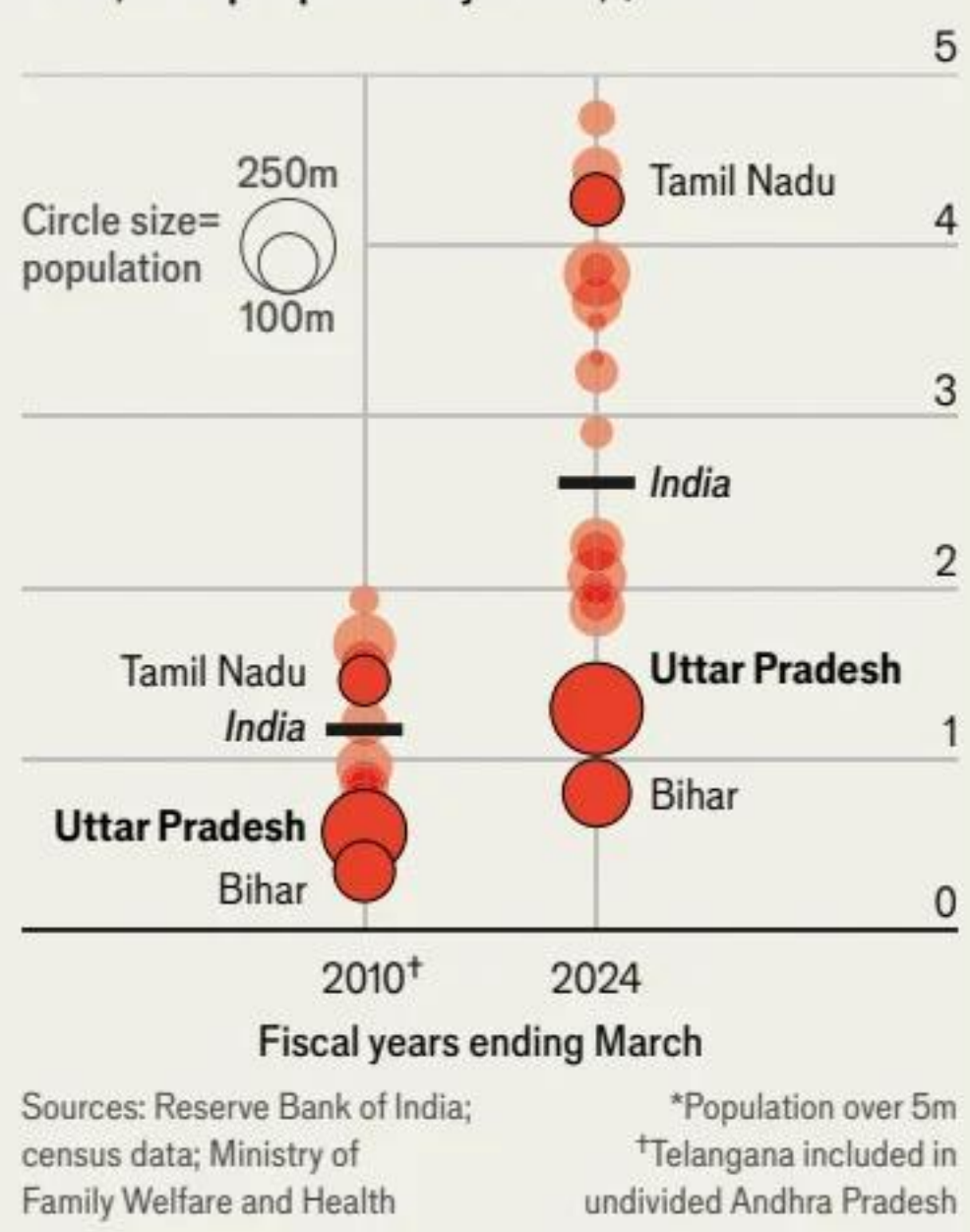
Try your Lucknow

There are signs of investment beyond Noida, too. Defence manufacturers have set up in a corridor that stretches to nearby Aligarh and Agra. IBM and Genpact, which provide IT services, have established large offices in Lucknow. Tax revenues have more than doubled in real terms since 2017. UP is one of a handful of states that runs a healthy budget surplus.

Yet it is not certain that Mr Adityanath has established a model of development that can sustain its current pace. UP has failed to attract labour-intensive industries such as clothing that could absorb its giant workforce. Its economy is powered by a

A laggard in Aligarh

India, GDP per person by state*, \$’000



small number of high-value jobs in the west. Elsewhere there is a long tail of low-quality, informal work. Frustration over the lack of opportunity was one reason why the BJP lost a swathe of seats in the state in national elections last year.

Growth matters because UP has so far to go. Income per head, at \$1,300, is about half of the Indian average (see chart 1). It is also unevenly spread. Travel beyond pockets of success, and you will see many places where people live in shacks and scratch a bare subsistence from the soil. Many women hardly leave the village, other than to toil in nearby fields for 225 rupees (\$2.50) a day. In Anai, a village 40km from Varanasi, locals pointed to new toilets that were built as part of a government scheme. They don’t work, and villagers still defecate in the fields.

Investment in infrastructure is not matched by that in human capital. Only 57% of adults work, roughly on a par with the national figure. But female labour-force participation, though rising—Mr Adityanath credits a policy of reserving a fifth of government jobs for women—is among the lowest of any state, at 35%. Abhishek Mishra of the opposition Samajwadi Party argues that flashy summits have yielded little investment, partly because investors doubt that UP’s workers will be productive.

The chief minister boasts of his “zero-tolerance approach towards criminals and corruption”. Since he took over, more than 250 suspects have been killed and more than 10,000 wounded during “encounters”, the Indian term for when police shoot a suspect supposedly resisting arrest. The property of alleged criminals is routinely bulldozed, earning Mr Adityanath the nickname “Bulldozer Baba”. Rather than proving that the buildings were bought with the proceeds of crime (which is hard),

the state sometimes asserts that they were erected without proper permission (which is true of large swathes of Indian cities).

The most accurately measured crime has indeed fallen. Between 2016 and 2023 the homicide rate per 100,000 people fell from 2.2 to 1.4 in Uttar Pradesh, compared with 2.4 to 2 in India as a whole (see chart 2). Voters approve. At a gathering of women entrepreneurs in Lucknow, most agreed that going out is less scary than before. More reliable electricity has improved street lighting. An acolyte at Mr Adityanath’s temple gushes: “He is like Lord Ram... good for the people who are good, and bad for the people who are bad.”

Sticklers for civil liberties are less enthusiastic. Many think a lot of the “encounters” are staged, amounting to extrajudicial executions. A former police officer denies this, but then adds that if “any gangster” were to go around “twirling his moustache” and boasting that he’s a gangster, “Let him see if he stays alive for 24 hours.”

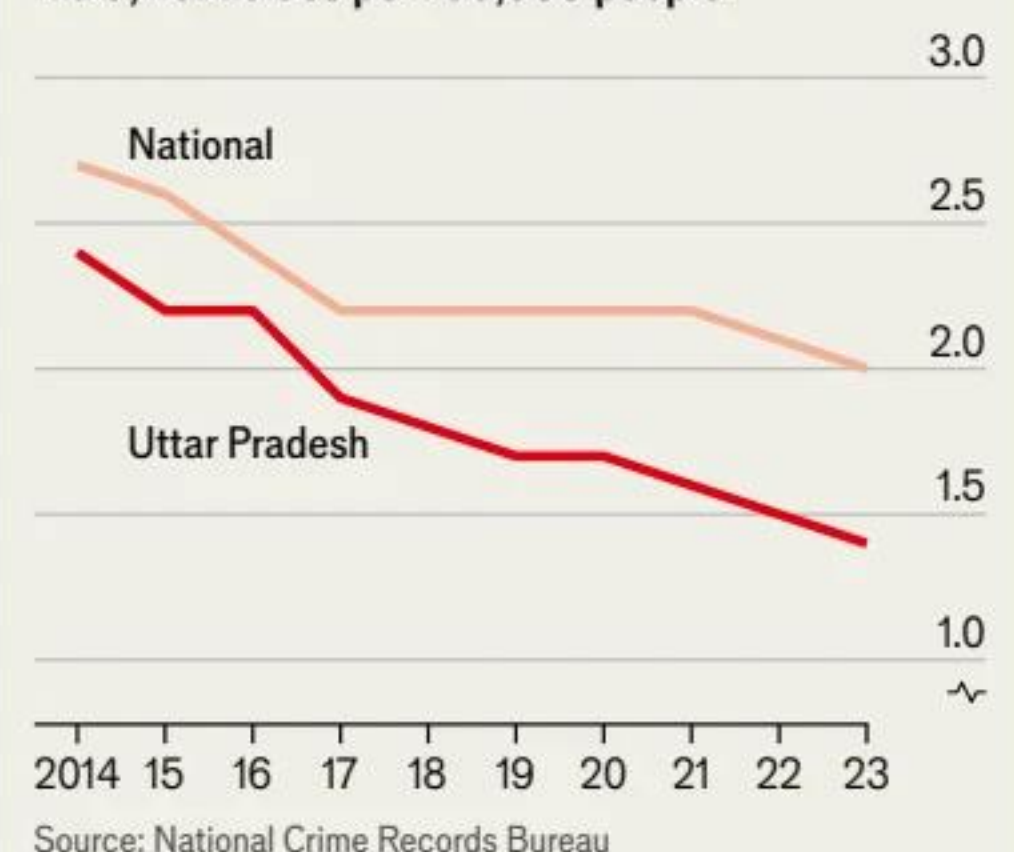
Muslims complain that the bulldozers are especially active in their neighbourhoods. In general, they are frightened of Mr Adityanath. He founded a youth movement that many describe as a militia, only disbanding it five years after becoming chief minister. In speeches, he often uses incendiary language about Muslims. He has accused them of waging a “love jihad”, seducing Hindu women so they convert to Islam and bear Muslim babies. Muslim men who date Hindu women have sometimes been arrested or beaten up by thugs.

The chief minister reassured *The Economist* that “there is no Hindu-Muslim conflict in Uttar Pradesh.” He boasted that “in the past eight-and-a-half years, there have been zero instances of rioting and no curfews.” And, he added, for context: “Around the world, we are witnessing violence even in countries with far smaller Muslim populations.” Some might detect in this a dog-whistle—that Muslims are troublemakers. Mr Adityanath’s pitch for India is loud and clear. If you like your Hindu nationalism blunt and forceful, he’s your man. ■



Not as Aggravated

India, homicides per 100,000 people



Nepal

Picking up the pieces

KATHMANDU

Nepal's youth toppled the government. Now they want to remake their country

THE VIEW from Ajaya Bhadra Khanal's office is a constant reminder of the high stakes of his job. A few hundred feet away sits the burnt-out shell of Singha Durbar, a 117-year-old palace that was until September 9th the office of the prime minister of Nepal. That day, rampaging mobs set it ablaze—along with the parliament, other federal buildings and several businesses. Prisons were opened and politicians attacked in their homes. K.P. Sharma Oli, the prime minister, resigned. The police vanished. Anarchy reigned.

What had started the previous day as a peaceful protest against corruption and a social-media ban escalated sharply after police fired at unarmed protesters, killing 19, most of them students. An outraged country took to the streets. Troublemakers took advantage of the chaos to settle scores. Only on September 10th did the army step in to restore order. Two days later Nepal's president dissolved parliament and appointed Sushila Karki, a former Supreme Court chief justice known for her rectitude, as interim prime minister. Mr Khanal is her chief adviser. From their premises next to the old palace, their task is to get their country back on track. Priority number one, says Mr Khanal, is to hold elections. Voting is scheduled for March 5th next year.

Almost three months after the near-total collapse of the state, an uneasy calm prevails in Kathmandu. Two emotions animate the capital: hope and fear. The hope is that elections will deliver a novel coalition with the imagination to fix the country's many problems, chief among them corruption and unemployment. The fear is that security challenges or major-party boycotts could delay the polls, setting off a fresh crisis.

Both outcomes are plausible. Nepal's politics is dominated by the left and in particular "three old men": Sher Bahadur Deuba (79) of the Nepali Congress; Pushpa Kamal Dahal, known as Prachanda (71), of the Maoists; and Mr Oli (73) of the Communists. Since the country adopted its current constitution in 2015, the three have propped each other up in coalitions, playing what many Nepalis see as a game of musical chairs to stay in power. It is an unstable arrangement—there have been seven governments since, excluding the interim one—but it works for the main players.

The old guard has yet to grasp the scale

of public anger. Mr Oli, still grumpy about being ousted, is demanding the restoration of parliament. The Maoists claim to have overhauled their workings, but remain essentially unchanged. The Nepali Congress is in the midst of an internal power struggle. But as a deadline to register for elections loomed this week, all three had agreed to take part.

Lending new energy to politics are the young protest leaders. Many are venturing into politics by starting their own parties. Kishori Karki, who went viral after rescuing an injured protester in September, received news of her party's registration as she spoke to *The Economist*. Pradip Gyawali, another prominent protester, has joined the interim government as an adviser. Others are being wooed by establishment parties. Ordinary Nepalis are fired up, too. Nearly 840,000 new voters have joined the electoral rolls since September.

It helps that the two biggest external influences on Nepal have clearly signalled their preference for elections. India has leant on the major parties to take part, and will provide security and logistical support to ensure a smooth vote. China, too, is keen to avoid instability on its border. Western countries are keeping their distance but have been quietly supportive.

Another reason to participate is fear. The spectre of corruption charges looms over establishment figures, should they lose their grip on power. Protesters worry that the police, many of whom were assaulted and some killed by gangs unaffiliated to the youth movement, could mount a campaign of revenge. Mrs Karki, a reluctant prime minister, fears a loss of legitimacy if the interim government's rule extends beyond March. And everyone is anxious about renewed unrest.

Corruption remains the main issue for Nepali voters. But underlying that concern is a deep anxiety about their futures. Nepal's median age is 26, yet its economy has little to offer the young. One in five young people is unemployed. GDP per person is barely above \$1,400, roughly half that of neighbouring India, where many Nepalis find work. Others travel to the Middle East, South Korea or the West. Nearly 2.2m of Nepal's 29m people live overseas, most of them men. "Many of my friends are abroad," says Mr Gyawali. "They told me to come there. But I want to be here and use my expertise to make the nation." ■



Thailand's foreign relations

Swinging state

SINGAPORE

America's oldest ally in Asia is warily drawing closer to China

THE DAY before Thailand's king arrived in China, his country's government sent his host a special gift. On November 12th She Zhijiang, an alleged Chinese criminal kingpin, was extradited from Bangkok after three years of legal wrangling. Mr She is accused of running extensive online gambling and fraud operations in Myanmar, and China had long wanted him back to face justice at home.

King Maha Vajiralongkorn is the first Thai monarch to visit China since the two countries established diplomatic relations half a century ago. His trip was the most high-profile signal yet that Thailand, which has long struck a careful balance between China and America, is leaning ever closer towards its northern neighbour.

The tighter relationship is visible across several spheres. Particularly notable is Thailand's responsiveness to China's trickier demands. The extradition was just the latest. In August an art gallery in Bangkok removed exhibits by Tibetan, Uyghur and Hong Kong artists, reportedly after Chinese diplomats complained. Earlier in the year Thailand sent 40 Uyghur men, who had been in detention since 2014, back to China despite offers from America, Canada and other countries to provide asylum. America pointedly noted its dismay as "Thailand's long-standing ally". But Thailand said it feared retaliation if it resettled the Uyghurs elsewhere.



Such moves may be the result of pressure from a mighty neighbour. But business, too, is driving the shift. Chinese firms are investing heavily in Thai infrastructure, from industrial parks to high-speed rail projects. The countries' relationship got a boost in 2023 when Pheu Thai, then the ruling party, sought more tourism and investment from China, according to a recent paper by Paul Chambers of Naresuan University. Bilateral goods trade reached \$122bn in the first ten months of this year, up from \$116bn in all of 2024.

China is also an important source of international visitors to Thailand, which depends on tourism for 12% of GDP and a fifth of all jobs. Chinese accounted for 6.7m of Thailand's 35.5m international tourist arrivals last year. That number plummeted to 3.4m in the first nine months of 2025 after Wang Xing, a Chinese celebrity, was kidnapped and trafficked across the border to a scam compound in Myanmar at the start of the year. Many Chinese tourists fear a similar fate if they travel to Thailand, which is now working with China to dismantle the fraud industry.

The security dimensions are equally striking. After America cut military financing and scaled back joint exercises following a Thai coup in 2014, China quickly filled the void. It offered submarines, tanks and armoured vehicles at lower prices than Western equivalents, and without lectures about democracy and human rights. Between 2016 and 2022 Thailand purchased \$394m in Chinese arms compared with \$207m in American weapons, according to the Lowy Institute, an Australian think-tank. It now buys anti-ship missiles, air-defence systems and armoured vehicles from China. America's military assistance to Thailand has fallen further recently, from \$106m in 2023 to \$8m in 2025.

Thailand has not entirely abandoned its American alliance, which traces its origins to a treaty of "amity and commerce" signed in 1833. The pair still conduct the region's largest multilateral military exercise every year. Titled "Cobra Gold", it involves some 30 countries and thousands of American troops. America remains Thailand's biggest export market—though Donald Trump's tariffs may affect that status, too. And Thailand is wary of swinging too far into China's orbit. Low-end imports, mostly from China, have hurt local manufacturing, leading to factory closures and job losses. More than 70% of Thai CEOs worry about further damage from cheap Chinese goods. While the Thai king was still on his five-day tour of China, Thailand's finance minister Ekniti Nitithanprapas quietly announced that the country would impose a 10% duty on low-cost imports from January 1st. The move was a rare pushback. Closeness to China brings its own risks. ■

Sports and citizenship

Own goal

SINGAPORE

When is a Malaysian footballer not a Malaysian footballer?

JOÃO FIGUEIREDO became a Malaysian citizen on June 3rd. A week later, he was a hero. Playing for the national football team, he opened the scoring against Vietnam, setting up a 4–0 drubbing of a regional rival. It was one of the great nights in Malaysian football. It has also become one of its most controversial.

The Malaysian victory that night was not particularly Malaysian. The team featured no fewer than five players who had become naturalised Malaysian citizens only a week before the match (and two more earlier in the year). None had been born in Malaysia, but all were deemed Malaysian by ancestry. According to the Football Association of Malaysia (FAM), at least one of each player's grandparents had been born in Malaysia, giving their citizenship a legal basis.

FIFA—football's global governing body—disagrees. After receiving an anonymous complaint following the match, it found Malaysia guilty of forging players' documents. It was, "pure and simple, a form of cheating", FIFA said. The FAM was fined and FIFA has referred the case to local criminal authorities. The players have been suspended for a year.

On November 17th FIFA released a report revealing the scale of the alleged shenanigans. It claimed that Mr Figueiredo's grandmother was not born in the Malaysian state of Johor, as FAM had asserted,

but in the Brazilian one of Minas Gerais. For similar reasons the Malaysian heritage of all seven players were all deemed spurious. The players, it was also revealed, knew little about the papers they were signing—largely because they were written in Malay, a language they did not understand. (Four players had never played for a Malaysian club before making their international debut; three had only signed for one in 2025).

Malaysia has denied intentional wrongdoing. After the allegations first emerged, the home-affairs minister said the players were granted citizenship after a "rigorous process". The association has said it will appeal FIFA's ruling to the international Court of Arbitration for Sport, though it has acknowledged that there may have been a "technical error". The prime minister has sought to distance himself from the episode; his government's sports ministry has frozen new funding for FAM.

All this has done little to calm furious Malaysians, who are demanding punishment for officials in FAM and the home ministry. The country is on the verge of qualifying for the Asian Cup, a tournament it has rarely played in. But a potential points penalty for the alleged fraud could jeopardise that. "The country doesn't hold much hope in the football association's ability to run the game, but even by those standards this scandal is really sickening," says Aysha Ridzuan, a local commentator.

And for some Malaysians, the episode is yet another example of the opacity of the country's citizenship process. Activists have seized on the footballers' expedited citizenship (five were issued passports the day they applied) to highlight a double standard. Around 120,000 stateless people live in Malaysia—many of them born and raised there. For them, the path to becoming Malaysian remains a long shot. ■



Son of another soil

China



Medical innovation (1)

Chinese pharma's big glow-up

China's cut-price drugmakers stand to make more money abroad than at home

AFTER AMERICA, China is the world's largest developer of new medicines. Its companies ran nearly a third of the planet's clinical trials last year. That is up from just 5% a decade before (see chart 1 on next page). It is also rising to the top in several critical areas of research, including those related to cancer. Investors have taken note. Shares in Chinese biotech companies have surged by 110% this year, which is more than three times as much as their American peers.

For much of the past century drug discovery was dominated by large European and American firms, which collectively are often called "big pharma". No longer. These companies face some of the steepest "patent cliffs" in their history, as drugs expected to generate more than \$300bn in total revenue over the next six years will lose their patent protection by 2030. To plug the gap, American and European firms are scouring the globe for promising

molecules, and increasingly, they are finding them in China.

The timing is rather awkward. America wants to reduce its reliance on Chinese supply chains, since it remains in a trade war that is only temporarily on hold. American officials fret already about China's chokehold on active drug ingredients, for example. And rumours fly around that the White House plans to crack down on Chinese pharma, though nothing has happened in this regard so far. Yet when it comes to creating the next generation of medicines, America's drugmakers, and its patients, are likely to become more, not

less, dependent on Chinese innovation.

The evidence for this is mounting. In May Pfizer, America's biggest drugmaker, agreed to pay \$1.25bn in fees to 3SBio, a Chinese biotech firm, for the rights to manufacture and sell an experimental cancer drug outside China, if approved. The following month GlaxoSmithKline, a British rival, struck a \$500m deal with Hengrui, another Chinese company, for a lung-disease treatment and the options to buy 11 more drugs, together valued at as much as \$12bn, depending on whether Hengrui manages to meet particular milestones in their development. Such deals are no longer exceptions. In the first half of this year nearly a third of all global licensing agreements signed by big pharma were with Chinese firms—four times the share in 2021 (see chart 2 on next page).

Getting the show on the road

Until recently, China's drug industry was best known for making generic drugs, supplying ingredients and running trials for Western firms. Over the past decade it has reinvented itself. Approval processes have been streamlined, priority reviews conducted for drugs tackling critical conditions, and regulations brought closer to international standards. The workforce at China's drug regulator quadrupled between 2015 and 2018, and a backlog of

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► 20,000 new drug applications was cleared in just two years. The time taken to secure approval for human trials shrank from 501 days to 87. And the output of new medicines soared. In 2015 China approved only 11 treatments, mostly Western imports. By 2024 the figure had risen to 93, with 42% developed domestically.

These reforms have been matched by efforts to lure back students and professionals who had studied or worked abroad. Many of China's "sea turtles", as such returnees are jokingly known, came back with experience of building biotech firms and dealing with investors and regulators. Their entrepreneurial zeal was bolstered by rules making it easier to raise funds and to list on the Hong Kong stock exchange.

Early signs of success abound. In November 2019 BeOne Medicines, a Chinese biotech firm formerly known as BeiGene, became the first local outfit to win approval from the Food and Drug Administration (FDA), America's drug regulator, for a cancer drug. More approvals followed. But the sector's big moment arrived last September, when a lung-cancer drug developed by Akeso Bio, a small Chinese biotech company, outperformed Keytruda, Merck's blockbuster therapy, in clinical trials.

What explains the rapid rise of China's drugmakers? The first answer concerns how quickly they innovated in order to produce "fast followers", which improve on existing drugs' safety or delivery. From there they were able to move on to "first-in-class" medicines with new targets (such as a protein or a gene linked to disease) or mechanisms (which might block or boost a target's function).

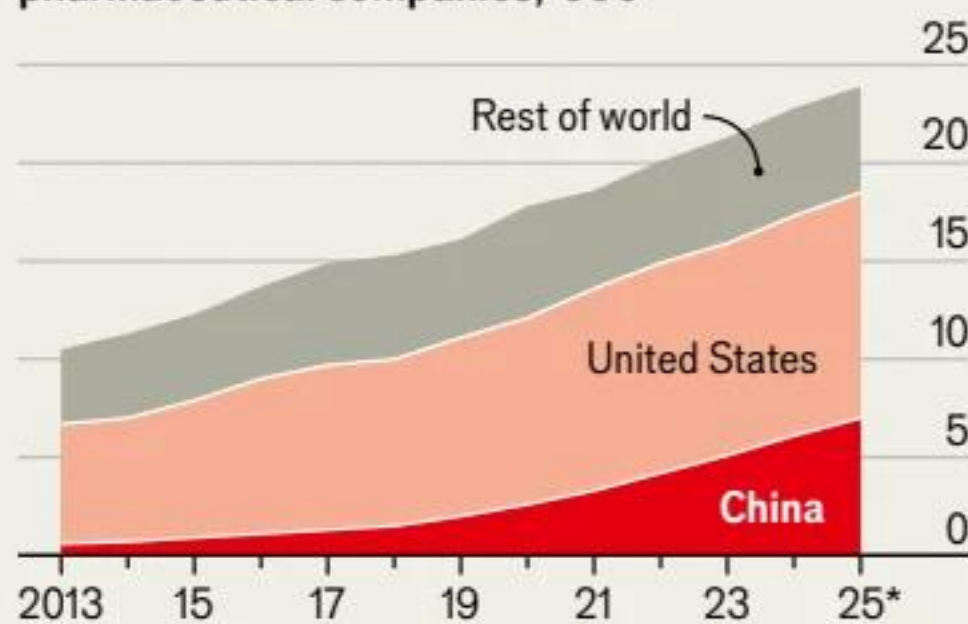
Pill thrills

Fast-follower and first-in-class treatments now make up more than 40% of the industry's pipeline, according to interesting research published last year in *Nature Reviews Drug Discovery*, a scientific publication, by Zimeng Chen of Tsinghua University in Beijing and team. Wang Xingli of Fosun Pharma, a Chinese drugmaker, explains that working on fast-follower drugs gave China's industry the "courage to do the first-in-class".

The second answer concerns the speed, scale and low cost of other processes. China's firms can take a drug from discovery to the start of human trials in about half the global industry's average time. Human trials themselves, usually the slowest stage in the development of a new drug, also move faster. A vast patient pool makes enrolment easier, and a large network of trial centres also speeds things along. This model has proved especially helpful for developing antibody-drug conjugates, a novel class of treatment that seems particularly potent at tackling cancer. One big-pharma executive says that China's appeal lies

Pilling up

Innovative drugs in development by pharmaceutical companies, '000



Clinical-trial starts by company location, %



Sources: Citeline; Iqvia Institute

*To January 3rd

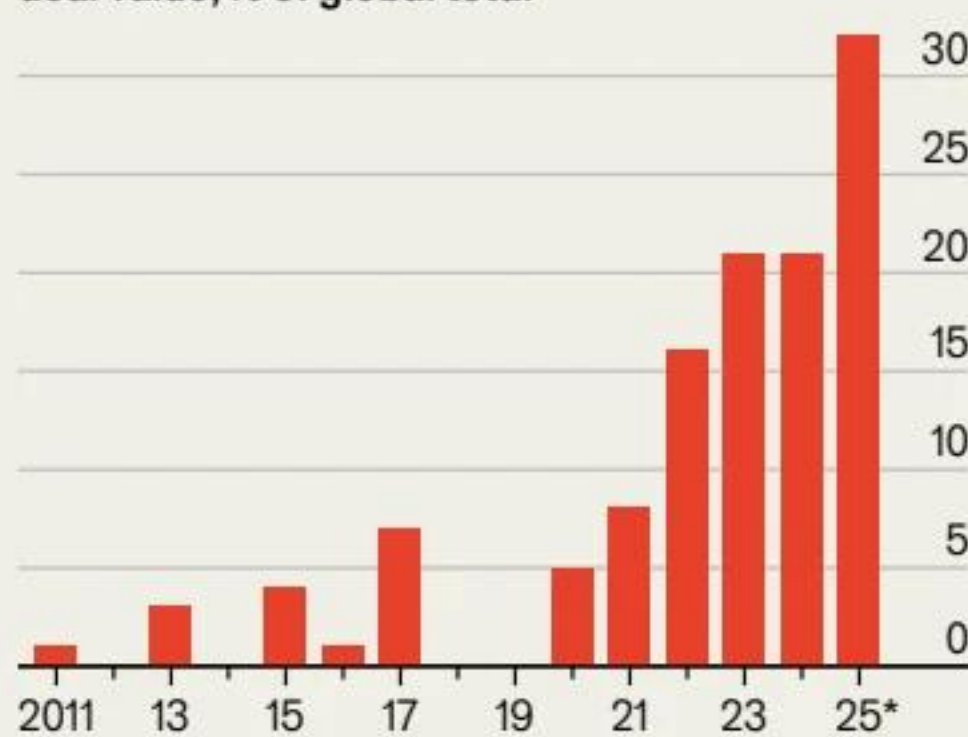
in the sheer number of firms experimenting: "You can pick the winners and improve the odds of approval."

Cancer remains a central focus for Chinese firms, but they are also branching out. Weight-loss drugs are a hot target. Patents on semaglutide—the active ingredient in Wegovy and Ozempic, the wildly popular weight-loss treatments made by Novo Nordisk, a Danish pharma giant—are due to expire in China next year. That has sparked a rush to prepare generics. Yet local firms are not just copying. Bloomberg Intelligence, a research firm, reckons there are 160 new obesity drugs in development around the world; about a third of them are from China.

Although the country is the world's second-largest drug market after America, it

Pharma drama

China, innovative drug out-licensing deal value, % of global total



Sources: Jefferies; PharmCube

*To June

remains a tough place to make a profit. McKinsey, a consultancy, puts its prescription-drug sales at about \$125bn in 2023, a sixth of America's. Most sales are still of generics. New medicines account for only a fifth of the market, a share that may rise to a third by 2028. Even then, the market will remain highly price-sensitive. State insurance covers most purchases, pooling demand from hospitals and forcing firms into bidding wars. To win coverage, drug-makers must often slash prices by half or more to reach a wide patient pool, or accept a far smaller private market.

That all explains why America and other foreign markets are such big prizes. The most common route to them is through licensing agreements with Western firms. Some Chinese firms now want a bigger slice of the pie. A growing model is the "NewCo", under which a biotech company sets up a legally distinct company in America, often backed by foreign investors, and spins off promising assets into it. Chinese pharma looks temptingly cheap to Westerners. The market value of listed Chinese biotech firms is less than 15% that of their American peers. Upfront licensing payments are typically two-thirds lower than, and total deal sizes about half of, comparable global transactions.

Another advantage of the NewCo model is that it can help mitigate some of the political concerns around Chinese pharma abroad. Others still abound, however, particularly around data privacy. Sharing patient data from clinical trials is complicated by privacy rules and related review processes. And the FDA has taken a strict approach to approving drugs based on trials that have been conducted only in China. In June it halted any new clinical trials that exported Americans' genetic data to China. A report published in April 2025 by a congressional committee that included Eric Schmidt, Google's former boss, warns that China's strength in drug discovery, combined with its advances in artificial intelligence, could soon allow its firms to eclipse America's. He and others fret about the security risks at the junction of pharmaceuticals and biotechnology.

There are also reasons for cautious optimism, however. More competition leads to more treatments appearing with smaller price tags. For patients long denied access to cutting-edge drugs, China's rise could help close the gap. That would particularly matter for those in need in poor countries. For Chinese drugmakers there are three critical challenges ahead: inventing novel therapies that work, breaking into new markets with them and passing the associated regulatory hurdles. Mr Wang notes that most Western giants took a century or so to reach today's scale. By that measure, he believes, China's industry is still "at a very early stage". ■

Medical innovation (2)

Dr Chatbot will see you right now

BEIJING

China wants AI and telemedicine to bolster its health system

CHINA'S PUBLIC-HEALTH system is both world-class and woeful. The best hospitals in Beijing and Shanghai have top-notch doctors, the latest drugs and gleaming equipment. But such places make up only around 10% of China's medical institutions. In the country's 33,000-odd township-level health centres, only half of general practitioners (GPs) even have university degrees. In total China spends around 7% of its GDP on health (for comparison Britain shells out around 11%).

When ill, Chinese tend to flock to specialists in big cities. That leads to massive queues, perilously overworked doctors and experts wasting their time on common diseases. Vast investment in basic services offered near where people live might help solve the problem, and local governments want to train and hire more doctors. But they are heavily indebted. And recruitment is tricky because the profession is neither particularly prestigious nor, outside the best hospitals, especially well compensated. One doctor in a hospital in Nantong, in eastern China, complains that overtime is constant and "all essentially unpaid". Past promises of pay rises have never materialised, he says.

Increasingly China is looking for high-tech solutions to its medical problems. In recent years both private companies and government officials have started promoting telemedicine and artificial intelligence (AI). There are still bottlenecks. But China has pressing reasons to make digital health care work: its rapidly ageing population will bring with it a wave of chronic diseases that the current system is ill-equipped to handle. By 2050, 487m people will be over the age of 60, about 35% of China's population, up from 21% today.

Despite earlier government initiatives, telemedicine only took off during the covid-19 pandemic. Chinese seized on apps launched by China's tech companies that allowed them to consult doctors either by text or video. One such app, called JD Health and launched by JD.com, an e-commerce firm, claimed to have 200m active users in the 12 months to June, with an average of over 500,000 online consultations a day. In June Ant Group, an affiliate of Alibaba, a tech giant, launched another app called AQ. As of September it had served 140m patients and nearly 1m doctors had offered their services on the platform, according to Ant.

In theory all this should help bolster local health-care offerings and give rural folk better access to faraway experts. "I don't think there's any country in the world that has embraced direct-to-consumer telemedicine quite like China," reckons Terence Cheng, of Monash University in Australia. Users are attracted by the "shopping experience" that China's apps offer. Patients can rate doctors and read reviews about their skilfulness.

Bottlenecks remain, however. The typical users of telemedicine apps are younger urban residents—in other words, people who already have the best access to China's public-health services. And the doctors who offer their advice on the apps usually use them to earn more money outside their regular hours. So it is hardly helping with overwork. One solution would be for hospitals to get doctors to allocate 5-10% of their daytime hours to telemedicine, argues Tang Shenglan of Duke University in America. That in turn would require tweaks to China's state-backed health insurance to make it easier for doctors to be paid for online work, he says.

Accepting AI health advice is the next step. Some in China already get help via chatbots such as those made by DeepSeek, a whizzy startup. China's government wants to push things further. Officials believe AI can significantly improve the capacity and efficiency of primary health-care services. In November it released a plan calling for "full coverage" of AI-powered diagnosis and treatment tools at grassroots health centres by 2030.

If local doctors could use AI models to access the latest advice, it could help build patients' trust in the tech, reckons Tien Yin Wong, who builds such models at Tsinghua University in Beijing. In turn that would result in more local treatment; only complex cases would go to big hospitals. And it could all happen without vast sums being spent on training new doctors. Mr Wong says officials from several towns and cities have approached his team about its models. For now they are tested only at a hospital affiliated with the university.

China still remains far from AI-supercharged health care. And thanks to a long history of scandals, Chinese tend to be suspicious of the medical profession. A bad AI-powered diagnosis could cause them to lose trust in the new technology too, fears Mr Wong. Another challenge will be getting enough data to feed into AI models. At the moment China's patient data is often poor quality and fragmented between different hospitals and clinics.

On the other hand, China has a history of rapid technological adoption. For instance, when Chinese people stopped using cash, they did not switch to plastic but jumped straight to mobile payments, thanks to a combination of nimble tech firms, encouraging officials, a digitally literate population and the lack of established alternatives. The same cocktail of factors may drive technological change in health care. In other countries trying to build primary health-care systems on a budget, the absence of these ingredients may also make China hard to imitate. ■



Hong Kong's terrible fire kills dozens

On November 26th a fire swept apartment blocks in the Wang Fuk Court housing complex in Hong Kong's Tai Po neighbourhood. The next day 55 people were confirmed dead and another 15 were in a critical condition. Some 279 were still missing. The fire's cause is unknown, but officials are looking into materials that were being used for renovations. It is one of the deadliest blazes in Hong Kong since the second world war.

CHAGUAN

Positive energy only, please

Why enforced online optimism is no remedy for economic gloom



THE POLICE in Weifang, a city in eastern China by the Bohai Sea, seem to be doing a bang-up job. A tidy 99.1% of its 9m residents are satisfied with public safety, according to the local government. From fraud to robbery, officials say crime there has fallen over the past year. But recently its police have been busy dealing with a trend that is much harder to expunge: the spread of negative feelings among the city's residents.

Here, the standard for falling foul of authorities is rather murky. In an announcement on November 17th, the Weifang police outlined cases from the past month. In one a local man, Mr Ren, had used his social-media account to publish videos that were critical of agricultural policies, allegedly pumping out distortions as he sought to attract followers. The police said they had prevailed upon him to remove his offensive videos. In another, a student surnamed Qiu got into trouble at school and then went online to accuse his teacher of being a bully. In doing so he had damaged the school's reputation, the police said. They brought the student in for a stern discussion to rectify his behaviour.

Weifang is far from alone in such policing of popular sentiment. China is in the midst of a national campaign that aims to squash pessimism and promote positivity. In some ways this is nothing new. One theme of Xi Jinping's leadership, dating to his rise to the top of the Communist Party in 2012, has been the promotion of "positive energy", especially in online discourse. People who post criticism of the government on social-media sites have always run the risk of seeing their accounts closed or suspended.

But the special emphasis now suggests China's leaders have something extra to worry about. One inference—fairly obvious—is that the economy is weak. About 17% of Chinese aged between 16 and 24 (excluding students) are unemployed, according to the latest official data. As in any country, disaffected young plus ubiquitous social media make for a volatile mix. Yet there may also be something else at play. The underlying dynamics of public opinion appear to be changing. For decades China has been one of the most optimistic countries, a place where people believe that tomorrow will bring better opportunities. In the past few years, however, that faith in progress has given way to doubt.

Detecting such shifts is fraught in a country where it is so hard to study public opinion. Nevertheless, data show growing frustration. In big surveys in 2004, 2009 and 2014, Martin King Whyte, a sociologist at Harvard, collaborating with researchers from Peking University, rejected the common assumption that gaping inequality was sowing discontent in China. Instead he concluded that people were more focused on fairness, ascribing success in life to attributes such as talent.

After a gap of nearly a decade, Mr Whyte updated that survey, the results of which were published earlier this year in the *China Journal*, a Western academic periodical. The change was striking. In the earlier surveys, about 62% of respondents agreed that hard work was always rewarded in China. In the new survey, that share was sharply down, to just 28%. Other research points in the same direction as pessimism apparently grows more pervasive. In a recent study by professors from Peking University in the *China Quarterly*, another journal, younger respondents were less likely to believe in upward mobility for children in poorer families.

All this needs a caveat. Chinese are gloomy, but still more optimistic than many in the West. Mr Whyte and his colleagues are careful to point out that they see no "social volcano" on the horizon. Nearly half of the respondents to their recent survey still thought they would be better off in five years' time, albeit down from nearly three-quarters a decade ago.

For the Chinese government, though, the mere fact that pessimism is on the rise is a problem. Not only does it reflect a weakened belief in official narratives about the spread of prosperity. It also speaks to a certain ennui with modern life, potentially sapping the can-do energy that has helped fuel China's success. When the cyber administration, China's chief internet regulator, launched its campaign against negative sentiment in September, it said that, among its targets, it wanted to counter the idea that working hard is pointless.

Discussion about the campaign has focused on the government's decision to ban three popular influencers from most major social-media sites. One was Zhang Xuefeng, a tutor who said that students from poor families would struggle to get good jobs since they lacked the right connections. A second was Hu Chenfeng, a live-streamer who divided the population into Apple and Android users as a shorthand for rich and poor. The third was Lan Zhanfei, a travel blogger whose ostentatious videos perhaps irked those less lavishly fortunate than himself. But the campaign has been broader. Authorities say that some 1,200 online accounts have been suspended or closed on Weibo, a social-media platform.

You make me happy when skies are grey

What are the results? Negativity has not disappeared. Whenever the government releases economic data, there are plenty of online comments about how tough things really are. Moreover, some blowback is inevitable. The term "positive energy", promoted by officials, now carries a tone of irony, if not outright cynicism, in private conversation.

At a time when social media stoke anger around the world, it is easy to understand why China pays them so much attention. Yet the party has set itself an ever-expanding mission. Its current campaign has taken aim not at criticism of the government but rather at depictions of reality. In such a situation, censorship can only mask the symptoms. The roots of China's new pessimism lie in its economy, not on its apps. ■

Middle East & Africa



China and global health

Strategic generosity

LUSAKA

As Western countries cut their health aid in Africa, why is China not doing more?

NAMED AFTER a late Zambian president, the English words “China Aid” on the façade of Levy Mwanawasa University Teaching Hospital on the outskirts of Lusaka reveal the true benefactor. It was built by China, which also paid for an expansion in 2020 that more than quintupled its capacity and turned it into one of Zambia’s biggest medical facilities. A rotating team of Chinese doctors helps make it one of the best. In a country that has long depended on health aid from Western countries, this hospital shows that another power is vying for influence. As the West scales back its support, many wonder whether China will fill the gap.

In China’s bid for worldwide political influence, health plays an important role. As he rolled out his global infrastructure scheme, the Belt and Road Initiative (BRI), China’s leader, Xi Jinping, did not just talk about pouring concrete. He also promised Chinese support for health projects.

China does not publish an annual figure for spending on health aid. Data from the Institute for Health Metrics and Evaluation at the University of Washington suggest that after a surge during the covid-19 pandemic, it has returned to a few hundred million dollars a year. This is a middling sum by rich-country standards, and small compared with the several billion that America is still spending, even after massive cuts this year by President Donald Trump. But China’s health aid is carefully targeted at countries where it seeks commercial or strategic rewards.

→ ALSO IN THIS SECTION

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39 Fragile truces in the Middle East

39 Where Pepsi beats Coca Cola

One is Zambia. It has rich reserves of copper and cobalt. China has poured billions into Zambian mines. In September a Chinese state firm agreed to invest \$1.4bn in an upgrade to the 1,860km Tazara railway between Zambia and the Indian Ocean port of Dar es Salaam in Tanzania. The project, originally built by China in the 1970s, was the focus of a trip to Zambia this month by China’s prime minister, Li Qiang. He was the highest-ranking Chinese visitor in more than 18 years.

Just a few years ago, China’s chances of being hailed as global leader in health might have seemed unlikely. Early in 2020 its response to the emergence of covid-19 in the city of Wuhan dented its credibility. It quickly shared genetic data of the virus, but only after an initial cover-up of the outbreak. Officials from the World Health Organisation (WHO) investigating the origins of the virus were kept on a tight leash. It remains cagey about the topic.

But China used the pandemic to boost its image among poorer countries, showering them with vaccines and protective equipment. According to AidData, a research group at the College of William and Mary in Virginia, China’s covid-related donations were worth more than \$4.6bn between 2020 and 2022, surpassing those of America (\$4.1bn) and Germany (\$3.6bn).

China’s pandemic handouts won plau- ►►

► dits in many recipient countries. In sub-Saharan Africa, 36% of government, civil-society and private-sector leaders surveyed by AidData said they viewed China much more positively as a development partner as a result of this aid. Only 6% said they had become more negative. It is hard to prove what China reaped politically from this. But the 70 states that have endorsed both China's claim to Taiwan and China's use of "all" efforts to unify with it include almost every African country. Most, including Zambia, have adopted this language in the past couple of years.

Since the pandemic, China has stepped up its presence in global health. In May, at this year's annual World Health Assembly, the decision-making body of the WHO, China's delegation was nearly twice as big as in 2019, before the covid-19 pandemic began. It was four times bigger than India's, and two and a half times the size of America's in 2024, before Mr Trump became president again and announced America's withdrawal from the WHO (it will leave in January).

China is not flashing the cash, however. At the assembly, it promised \$500m over the next five years to WHO funds. With America out of the picture, this would make China the biggest government donor. But the pledge is in line with what it would be expected to pay, given the size of its economy. The Gates Foundation, an American NGO, now towers above governments: it supplies nearly 11% of the WHO budget, compared with China's 2.8%.

China's aid efforts have suffered from a lack of co-ordination among the various ministries involved. The China International Development Co-operation Agency, set up in 2018, is small and lacks bureaucratic clout. Dr Ruby Wang of LINTRIS Health, a consultancy, notes that China does not say it wants to fill the gap left by the West. She says its approach remains "piecemeal, opportunistic and experimental" as it seeks to maximise "political and economic objectives" as well as pursue "development in the Western sense".

Take Zambia. America used to supply the country with more than 80% of its funding for combating HIV. It had pledged more than \$360m in 2025 before Mr Trump pulled the plug. By its own reckoning, America's aid before Mr Trump's cuts accounted for one-third of Zambia's spending on public health. Compared with that, China's support is tiny. On November 20th it pledged \$3.5m over the next two years for HIV prevention in South Africa. In Zambia it donated 5,000 HIV test kits worth maybe a few thousand dollars.

Zambia also shows how Chinese efforts to boost its soft power through health aid can be complicated by its other activities. In February the collapse of a dam at a Chinese copper mine caused a massive spill of

toxic waste and a political uproar. Zambia's president, Hakainde Hichilema, was elected in 2021 partly on the back of public anger over alleged corruption and profligate borrowing involving deals with China under the previous administration. Even so, Mr Hichilema still sees Chinese investments as crucial for Zambia's economy.

The Trump administration is not oblivious to China's political gains on the continent. In September it published an "America First Global Health Strategy", which insists America remains committed to being "the world's health leader". It says that, especially in Africa, American health aid could be "an important counterweight to China". It called for a new approach to delivering it: by routing assistance mainly through recipient-country governments. This would "maximise the impact of our aid" on bilateral relationships, it said. The one-time health-aid superpower, in other words, is copying China's playbook. ■

Guinea-Bissau

Coup in cocaine country

NAIROBI

Soldiers have taken power in the narco-state, but their aims are unclear

AFTER A TWO-YEAR lull, during which Optimists could have imagined the contagion had stopped, Africa appears to have experienced two coups in as many months. On November 26th army officers in Guinea-Bissau, a tiny west African country of 2m people, became the latest military faction to call time on civilian government. They followed their peers in Mada-



Awaiting clarity

gascar, who intervened in the name of solving a political crisis on the island in October. It is still too early to know the true intentions of Guinea-Bissau's putschists. But should they prevail, theirs would be the 11th successful coup in Africa this decade, a far higher tally than in the 2000s or the 2010s.

The officers who announced the takeover claimed to have seized "total control" of the government for an indefinite period. Appearing on state TV shortly after gunfire was heard near the presidential palace in Bissau, the capital, they said they had closed the country's borders and suspended its ongoing electoral process. Umaro Sissoco Embaló, the incumbent president, was arrested. In a phone call to France 24, a news outlet, he said he had been "deposed". A key opponent of the president, as well as the army chief and his deputy, are also reported to have been detained.

Two key elements lie behind the crisis. The first is Guinea-Bissau's chronic political instability. The country's politics has been characterised by a succession of coups—this is at least the tenth attempt at one since independence from Portugal in 1974—and combustible elections.

The latest electoral dispute was triggered by Mr Embaló's heavy-handed attempt to win a second term. Both he and his rival, Fernando Dias da Costa, claimed to have won before results of the election on November 23rd were formally announced. The electoral commission had been due to weigh in on November 27th.

A related factor is Guinea-Bissau's role as a hub for the global cocaine trade. The powerful army has long had links to international drug traffickers, who are so enmeshed in the country's politics that Colombian drug lords can be spotted driving luxury cars around Bissau.

Guinea-Bissau's cocaine trade has flourished under Mr Embaló, says Lucia Bird of the Global Initiative Against Transnational Organised Crime, a think-tank, fuelling suspicions that the president and his allies were benefitting from it.

Many in Guinea-Bissau question whether this is a "normal coup", says Ms Bird. Suspicions are rife that the president orchestrated a coup attempt as a pretext for retaining power, whatever the result of the election.

For now, that is speculation. But it is not the first time the president has been accused of using the spectre of a coup to grab power. Mr Embaló dissolved parliament following an alleged coup attempt in 2023 and has ruled without a legislature ever since. After he came to power in 2020 following another disputed election, the army occupied state offices before his inauguration. A putsch favouring the government would be unusual. But unusual things happen in Guinea-Bissau. ■

Yemen

The war that refuses to end

RIYADH

Mired in financial crisis, the Houthis resume threats to Saudi Arabia

ON NOVEMBER 3RD lunchtime in the Saudi capital was interrupted by air-raid sirens. Officials said it was a routine test (they did a similar exercise in 2021). But the klaxons and mobile-phone alerts were also a reminder of the unresolved war across the kingdom's southern border.

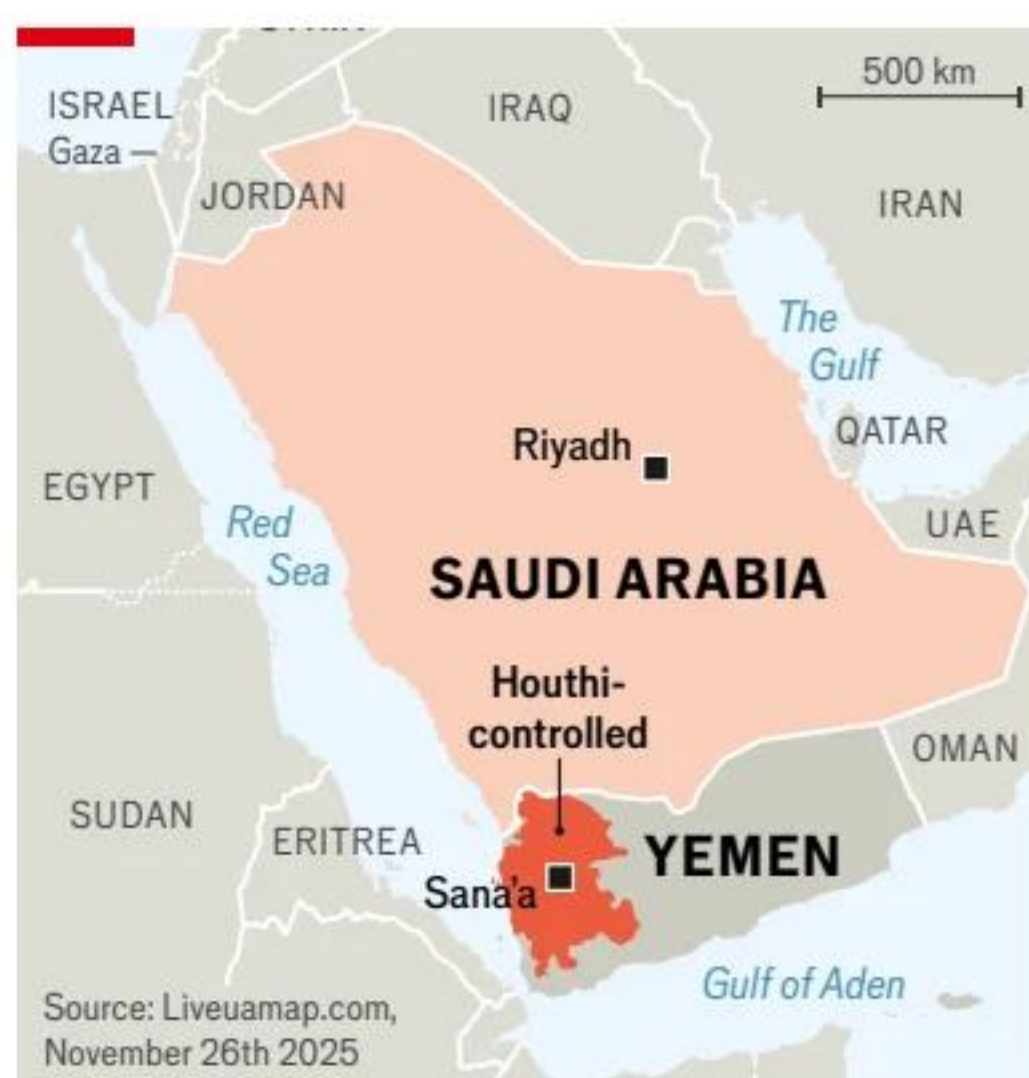
In 2014 the Houthis, an Iranian-backed militia that had fought a long insurgency against the Yemeni government, marched out of their stronghold in the country's north. They eventually seized control of Sana'a, the capital, and most other big cities. The next year Saudi Arabia assembled an Arab coalition to beat the Houthis back. But it quickly sank into a quagmire. More than a decade later the Houthis still control most of Yemen's west, home to three-quarters of the population (see map).

A UN-brokered ceasefire between the kingdom and the Houthis has largely held for almost four years: the militia has not attacked Saudi cities since 2022. But a full deal to end the war has proved elusive, largely because of Houthi intransigence. Whenever the Saudis offer a concession, the militia pockets it and demands more.

Since October 7th 2023, though, the Houthis have had other priorities. The group started firing missiles and drones at Israel soon after it invaded Gaza, a show of solidarity with Palestinians that also proved a useful distraction from its domestic misrule. Yet the Gaza ceasefire, which took effect on October 10th, has halted the campaign against Israel for now. Some diplomats worry that the militia will now turn its attention back to Saudi Arabia.

The Houthis have already sharpened their rhetoric against the kingdom. In September Abdel-Malik al-Houthi, the group's reclusive leader, accused it of being in league with Israel. Last month Houthi propagandists warned of renewed cross-border attacks if the Saudis did not lift their "economic strangulation" of Yemen.

That points to the underlying reason behind the threats: the Houthis are struggling with a financial crisis. The reasons for it are myriad. Israeli strikes—retaliation for Houthi attacks—have damaged ports, cement factories and other businesses that generated revenue for the group. American sanctions have cut off financial flows. Hard data are scarce, but some Yemeni analysts also see signs of a drop in remittances to Houthi-controlled areas, largely driven by fatigue in the diaspora and tighter



restrictions on money transfers.

The group still has illicit sources of revenue, from drug-trafficking to cryptocurrency schemes. But it is clearly squeezed. Some months it pays partial salaries; other months, nothing at all. Wadhah al-Awlaqi, an economist at the Sana'a Centre for Strategic Studies, a think-tank, estimates that food and fuel imports in Houthi-controlled areas were down by 20% and 27% respectively up to August, compared with the same period last year.

A peace deal under discussion for the past few years would commit Saudi Arabia temporarily to pay public-sector salaries in Houthi-controlled areas. Even if they can-

not reach a final agreement, the Houthis may hope to use threats to force the kingdom into paying for peace.

Yet such brinkmanship could backfire. By the time the Saudi-Houthi ceasefire took effect in 2022, the war in Yemen had upset the kingdom's allies. Thousands of Yemeni civilians were killed by poorly targeted Saudi strikes, while many more died from hunger and disease. Joe Biden restricted arms sales to Saudi Arabia soon after he took office in 2021. By then the United Arab Emirates (UAE), the most capable member of the Saudi-led coalition, had already withdrawn most of its troops.

Things look very different today. Both Saudi Arabia and the UAE are on good terms with Donald Trump, who ordered a seven-week bombing campaign against the Houthis earlier this year to halt their attacks on commercial shipping.

The president declared Saudi Arabia a major non-NATO ally and signed a defence pact with the kingdom when Muhammad bin Salman, its crown prince, visited the White House on November 18th. He may face pressure to help if Saudi Arabia is attacked again. Israel, for its part, could decide to step up air strikes against the Houthis—not only to weaken an enemy, but also to strengthen its ties with Gulf states, which frayed during the Gaza war.

The war in Yemen has slipped down the global agenda over the past two years. It may not stay there. The Houthis have honed their capabilities through two years of attacks on Israel. Recruitment is said to be up, though it may not all be voluntary (the Houthis practise forced conscription and use child soldiers). The group's leaders are more uncompromising than ever. "Everyone thought they could manage the situation in Yemen," says one diplomat. "It won't work any more." ■



Is it payday yet?

Israel and Lebanon

Febrile states

JERUSALEM

The killing of a Hizbullah commander shows how fragile truces are

HE WAS ABOUT to mark a year in his post as military chief of Hizbullah, the Shia-party-cum-militia that is fighting to preserve its dominant position in Lebanon. That was not to be. On November 23rd Haytham Ali Tabatabai was killed, along with at least four others, in an Israeli air strike in southern Beirut.

Mr Tabatabai's assassination is the latest of dozens of strikes against Hizbullah that Israel has carried out since it signed a ceasefire with Lebanon a year ago. The Lebanese government says those raids have killed 331 people. Yet it was only the second such strike in Beirut, Lebanon's capital. Israel insists that the attack did not breach the truce. But it is a reminder that ceasefires in the region remain shaky.

Appointed at the end of November 2024, just after the ceasefire came into effect, and tasked with rebuilding Hizbullah's military apparatus, which Israel had wrecked in 2024, Mr Tabatabai was a marked man. His predecessor, Ibrahim Aqil, was killed by an Israeli strike less than two months after he took the job.

Mr Tabatabai's assassination comes as the ceasefire between Israel and Lebanon is under increasing strain. In 2024 Israel destroyed much of Hizbullah's long-range rocket arsenal and a chain of underground outposts along the border. These were built to launch a surprise attack on Israeli communities in the north of the country, on a much larger scale than the Hamas attack on southern Israel on October 7th 2023. The ceasefire, brokered by America and France, was supposed to prevent Hizbullah from rearming. It included assurances that the Lebanese army would deploy in southern Lebanon and confiscate what remained of Hizbullah's weapons.

For the first few months, this seemed to be working. Yet Israeli and American officials are complaining that Hizbullah has successfully pressed the Lebanese army to desist. Last week, in a sign of displeasure, America cancelled meetings scheduled at the Pentagon for Lebanon's army chief.

Lebanon complains that Israel's air strikes and continued occupation of five outposts within Lebanese territory breach the ceasefire. Israel has no intention of changing course. "After October 7th our strategy has to be preventing any threat on our borders," says an Israeli general. "If this can be achieved through ceasefires, great. If not, we will continue to attack."

Hizbullah has yet to respond to the killing of Mr Tabatabai. Israeli intelligence agencies believe the group is unlikely to retaliate, though as a precautionary measure against drone attacks GPS coverage has been disrupted in northern Israel.

The fragility of the ceasefire with Lebanon mirrors the state of the region. More than 340 Palestinians have been killed in Gaza since the ceasefire came into effect there on October 10th, according to local authorities. A truce that ended the 12-day war between Israel and Iran in June is holding for now. Yet Israeli officials have been warning that another war with Iran "is just a matter of time" if the Islamic Republic

continues to develop its nuclear and ballistic-missile programmes. The Gaza and Iran deals were brokered by Donald Trump. An American attempt to resolve a dispute between Israel and Syria over the Golan Heights has yet to bear fruit.

All this shows that ending wars needs sustained attention. "America imposed ceasefires with Hamas, Hizbullah and Iran and is trying to do the same now with Syria, but it's not enough just to say there's a ceasefire," says an Israeli security official. "Trump likes to list the wars he's ended, but making sure they don't flare up again takes a lot of work." Those hoping for a quick fix in Ukraine should take note. ■

Pepsi v Coca Cola

The Middle East's soft-drinks war

AMMAN, BAGHDAD AND BEIRUT

Pepsi's unusual dominance is entwined with the region's political history

ORDER A FIZZY drink in Baghdad or Beirut and chances are you'll be served a Pepsi. Unlike anywhere else in the world, in the Middle East Pepsi has managed to trounce Coca Cola. Its success is part random chance, part clever navigation of political fault lines that have not spared America's big soft-drinks companies.

Pepsi's dominance has a long history. Back in the 1960s Arab governments imposed a boycott on Coca Cola after the firm said it would open a bottling factory in Israel. Though the boycott lost steam towards the end of the 1980s, when Coca Cola sponsored the youth football world cup in Saudi Arabia, the intervening years gave Pepsi plenty of room to cement its dominance.

In doing so it shrewdly played local politics, says Kamel Abdallah, a Lebanese soft-drinks tycoon. In Iraq it fostered good relations with the Arab parts of the country (Coca Cola trumps it in Iraqi Kurdistan, where Turkey's influence is stronger). The Baghdad Soft Drink Company hosts the largest Pepsi factory in the world, according to Haider al-Bassam, its boss. In Lebanon, the family behind the country's Pepsi production has close ties to influential Druze factions. In Saudi Arabia, which led the original boycott against Coca Cola, Pepsi's market share is 70%.

But there is a striking island of Coca Cola red in a sea of Pepsi blue: the Palestinian territories that prompted the boycott back in the 1960s. Coca Cola's market share in the West Bank is some 90%, says Zahi Khouri, the firm's licens-

ee there. In 2022 he opened a Coca Cola factory in Gaza.

The factory was flattened in the Gaza war. That war also put fresh pressure on both companies, as people in the region resumed boycotting American brands in protest at America's support for Israel. Local soft-drink brands, such as Jordan's Matrix or Lebanon's Zee Cola, started to eat into the American firms' dominance.

However, by most accounts they don't taste nearly as good. The industry's big hitters are already clawing back whatever market share they briefly lost. For the time being, the Middle East's soft-drinks landscape looks set to remain blue with a splodge of red.



That's what I like

Europe



Ukraine

The maze runners

KYIV

A baffling week of diplomacy may lead towards a peace plan, or Ukraine's downfall

A WEEK IS a long time in Ukraine. On November 19th reports emerged of a secret Russian-American "peace plan", one that looked to Ukrainians like a demand for capitulation. By the weekend European, Ukrainian and American officials were in Geneva for an emergency summit to rework the proposal. On November 26th American and Russian negotiators finished consulting in Abu Dhabi on that revised draft. Those with knowledge of the latest talks say the document is still in flux. Ukraine is happier with the latest version, but no one imagines Vladimir Putin will agree to it. The process is tilted against Ukraine: talks aim at reconciling Russian demands with Ukrainian concessions. And the Kremlin is likely to get the final word.

But in Kyiv, last week's panic and profanities have given way to cautious relief. The talks in Geneva removed the worst features of the original 28-point plan, apparently penned by America's special en-

voy, Steve Witkoff, with heavy Russian input. The new 19-point version eases limits on Ukraine's army (to 800,000 instead of 600,000). It removes an amnesty for war crimes and any reference to America getting some of Russia's frozen assets. But some of the thorniest issues are set aside for Donald Trump to discuss with Volodymyr Zelensky. These include Russia's territorial demands, a constitutional change ruling out NATO membership, and the exact nature of America's security guarantee.

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A meeting between them at the White House, which was originally planned for November 27th, has been delayed.

It is hard to judge how real the peace process is. Certainly, the latest rounds of American bargaining and pressure on Ukraine are the most substantial yet. "This isn't another round of what we saw before," says a Western diplomat in Kyiv. Those close to the talks speak of "serious progress" bringing some Ukrainian and Russian positions together. "We are coming to a point where people will have to say yes, we're on, or nope, that's it," said one informed source. But the source predicted that Russia would soften only at the end of the process, which remains months away at best. The question is when Russia will start to yield "and what the position on the front lines will be".

Mr Trump appears to have dropped his demand for a Ukrainian signature before December. He may be frustrated by what comes next. Ukrainian observers think the Kremlin will not be ready to bargain until late winter. That is when Mr Putin will have to decide whether to launch a wider round of conscription, and when Russia's economy will start to feel real stress from falling oil revenues and sanctions.

If America's diplomacy looks incoherent, it is in part because of internal rivalries. On one side are Mr Witkoff and the

► vice-president, J.D. Vance, who seem bent on a settlement that favours Russia and prioritises American commercial interests. On the other are the more traditional players of the intelligence community and State Department. Marco Rubio, the secretary of state, has laboured with European allies to put things back on track. Sources in the White House say Mr Rubio won this battle, but it will not be the last.

The plotting may not be just within the administration. On November 25th Bloomberg published two recordings, one purportedly of a phone call between Mr Witkoff and Yuri Ushakov, a Kremlin foreign-policy adviser, and a second one between Mr Ushakov and Kirill Dmitriev, Mr Putin's special envoy. Mr Witkoff is depicted coaching Mr Ushakov on how Mr Putin should approach Mr Trump. He also suggests that Mr Trump will back Russia's demand to be given the rest of Donetsk province, which is still held by Ukraine—perhaps the toughest sticking-point of any potential agreement.

Mr Dmitriev denies the calls took place, but Mr Ushakov has been less categorical. In a more conventional American administration the leak might have led to Mr Witkoff's dismissal. Instead, Mr Trump has confirmed that his special envoy will travel to the Kremlin next week to meet Mr Putin. The American liaison to Ukraine will be Dan Driscoll, the army secretary and a close ally of Mr Vance.

All this comes at a moment of deep tension in Ukrainian politics. A corruption scandal centred on Energoatom, the state nuclear company, involves members of Mr Zelensky's inner circle. Timur Mindich, the president's former business partner, has fled to Israel after being accused of co-organising a scheme to defraud the company of at least \$100m via kickbacks on contracts. Two ministers have fallen. A former deputy prime minister—another longtime

friend of the president—faces fraud charges. Mr Zelensky has refused calls to overhaul his government or fire his powerful chief of staff, Andriy Yermak, who has bought himself time by leading the Ukrainian side in the peace negotiations.

Compared with the threat of internal instability, the battlefield can seem almost a secondary concern. Some analysts think Ukraine's position is manageable. Russia has yet to show it can turn its creeping advances into a big breakthrough. "At this pace—and at this cost—there is no way Russia can win strategically," says Andriy Zagorodnyuk, a former defence minister.

But on several important indicators, things are looking worse for Ukraine. It is running out of soldiers. Russian investment in mass-producing drones is paying off: it is choking Ukraine's supply routes behind the front lines. And new weapons in the pipeline—jet-powered strike drones and glide bombs—threaten to make east-

ern cities like Kharkiv and Dnipro uninhabitable. Russia may be poor at conquering, but it excels at destruction.

With that prospect, many in Ukraine are sceptical that Mr Putin will ever accept a deal that allows Ukraine to survive. Forcing him to do so would require real American pressure, which has not been forthcoming. One former Ukrainian diplomat thinks Ukraine's best chance is simply to keep on fighting without losing its allies.

That requires renewed flows of foreign funding, which at this point must come almost exclusively from Europe. An EU summit scheduled for mid-December, which could decide the fate of the frozen Russian assets, is more critical than ever. "The path has become very narrow," the source says. "Avoid a blow-up with Trump. Keep the weapons flowing, paid for by Europe. And then wait, in the hope that the Kremlin reaches the point where it thinks the war becomes unsustainable." ■

Europe's new diplomacy

Meet Macmerzmer. Or is it Sterzcron?

BERLIN, LONDON AND PARIS

Macron, Merz and Starmer are forming a new trilateral leadership

AS EUROPEANS scrambled to help Volodymyr Zelensky push back on America's 28-point peace plan, the Ukrainian president's first European call was with the leaders of Britain, France and Germany. In Johannesburg for the G20 summit, this trio—Britain's Sir Keir Starmer, France's Emmanuel Macron and Germany's Friedrich Merz—sat down together the next day to agree on a strategy, dispatching their respective national-security advisers to meet American and Ukrainian delegations in Geneva. Quietly, the trio is emerging as Europe's new top-tier leadership.

An earlier duo of German and French leaders, Angela Merkel and Nicolas Sarkozy, gave rise to the nickname "Merkozy". Contractions of the current trio's names are less catchy: Macmerzmer? Sterzcron? Yet their collaboration, known as the E3, is becoming just as tight. Co-operation is neither institutional nor a pre-cooked strategy. This ad hoc leadership has emerged because it seems to work. It began to take root when Mr Merz took office in May, and after Britain had voted in 2024 for a government that made a reset with the European Union a priority. Just days after Mr Merz became chancellor, the trio made an 11-hour train ride to Kyiv that was crucial in helping them to bond.

Since then they have consulted closely on how to help Mr Zelensky, handle Amer-

ica's Donald Trump, and face down the Russian threat to Europe. Their national-security advisers—Britain's Jonathan Powell, France's Emmanuel Bonne and Germany's Günter Sautter—speak several times a week. On November 18th Sir Keir flew to Berlin to join Mr Macron and Mr Merz for dinner; they discussed Ukraine, European security, Iran and Gaza, agreeing to confer more often *à trois*. "The three get on well, trust each other, and I think share the view that, even if you have ties to the US, the Russian threat and geopolitical context mean that Europe has to take charge of its own security," notes Benjamin Haddad, France's Europe minister. The E3 suits and even impresses Mr Trump, says a German official. This week Johann Wadephul, Germany's foreign minister, called the E3 Europe's "working muscle".

The trilateral format first emerged in 2003, when the three countries' foreign ministers went together to Tehran to try to negotiate with Iran over its uranium-enrichment activities. Europe's diplomatic efforts to that end have kept co-ordination going. But not since Britain voted to leave the EU in 2016 has the link between the three countries' leaders been this strong.

The revived E3 has a lot to do with the three politicians themselves, an improbable trio forged by chronic domestic weakness and external threats. Their styles have



▶ little in common: Sir Keir's stiffness and Mr Merz's businesslike manner contrast with Mr Macron's energetic showmanship. Yet each has spent time outside politics: Mr Macron as an investment banker; Sir Keir, a public prosecutor; Mr Merz, a corporate lawyer. Although from different political families, they are all serious pragmatists, keen on getting things done. Each also happens to be deeply unpopular at home, in charge of a weak government and threatened by the populist right. When the three meet, says one official wryly, they bond over their shared political woes.

For France, the E3 appeals as a step towards what Mr Macron has long called European "strategic autonomy". This has to include Britain, the continent's only other nuclear power. Long seen as a Gaullist fantasy, the idea now carries weight in a Europe faced with a disengaging, if not hostile, America. Mr Macron and Mr Merz have warmed up Franco-German ties that had gone cool. France and Germany have also bound themselves tighter to Britain through bilateral treaties signed or updated this year. This web of treaties now links the three countries in what a French official calls "multi-bilateralism". For Britain, says Anand Menon of UK in a Changing Europe, a British think-tank, direct links with France and Germany are "a way of compensating for Brexit". The Anglo-German treaty identifies closer trilateral co-operation as one of its explicit ambitions.

So far the trio has been most closely aligned on Ukraine. They are behind the "coalition of the willing" that has been planning a reassurance force to be sent to Ukraine in the event of a ceasefire. Co-led by Britain and France, it now has a military headquarters outside Paris. Germany will not put boots on the ground. But Mr Merz has co-chaired coalition meetings, including the one on November 25th. On other matters, notably recent diplomacy over Iran's nuclear programme, the E3 gives Europe a distinct, united voice.

The E3 plainly faces limits. Britain and France agreed to recognise a Palestinian state; Germany, for historical reasons, was never going to follow. Germany and Britain are reflexively Atlanticist and happy to buy American arms; France wants Europe to buy European. Brexit constrains the E3's ambitions: China policy, for instance, is largely about trade, an EU competence where Britain cannot play a role.

Even if the E3 proves its political worth, says one adviser, it will not endure if it is seen by fellow Europeans as a top-down *directoire*, or exclusive club. Some Europeans are wary. Italy hates being left out. Poland, which hoped to revive the three-way "Weimar triangle" with France and Germany (until its election of a nationalist president this year quashed that), is not pleased either. Mindful of this, the three leaders have

tried to keep the format flexible. At various times they have brought in Poland, Italy, Finland, EU institutions and NATO.

If Europeans end up having to swallow a deal on Ukraine made over their heads, the E3 will not look like a very potent format. If used deftly, however, it could help to keep Europe relevant, defend Ukraine's interests and curb Mr Trump's worst instincts. Those may not be soaring ambitions. But Macmerzmer may be Europe's best hope of achieving even them. ■

Denmark

Final letter

COPENHAGEN

The Danes are preparing to cancel Christmas cards

WHEN PETER KURRILD-KLITGAARD and his family moved to Frederiksberg, a leafy neighbourhood of Copenhagen, 17 years ago, they had five or six post boxes within a few minutes' walking distance. Today there are none. They have been progressively removed by PostNord, the state-owned mail service. On December 30th PostNord will take things further: after 400 years, it will end its collection and delivery of letters entirely.

Denmark will be the first European country to do so. The step is demand-driven: over the past 25 years the volume of letters has declined by 90% (see chart). In 2024 alone it fell 30%, the result of a new law that ended Denmark's universal service obligation (which required postal companies to make service accessible to everyone at an affordable price) and opened the market to rivals. It also scrapped the postal service's exemption from value-added tax. Postage for a standard domestic letter shot up to 29 kroner (\$4.50), and 39 kroner for next-day delivery. That sealed the letter's fate. "In 2023 we

still received 50 Christmas cards by post," says Mr Kurrild-Klitgaard. Last year the family received one.

Post offices all over the world have seen the volume of letters collapse over the past two decades, as email, text messages and social-networking sites replace paper. The covid-19 pandemic exacerbated the trend: housebound people communicated online more than ever. Meanwhile e-commerce took off, and the number of parcels continues to grow fast. In 2022 the number of packages shipped was 161bn worldwide; it is projected to reach 256bn by 2027.

Some post offices have reinvented themselves. Privatised services, such as those of Malta and Portugal, are generally in better shape than state-run ones. Italy's partly privatised Poste Italiane has had a good run under Matteo Del Fante, an ex-banker. The profitable firm provides banking and insurance services as well as delivering letters and parcels. Postepay, its pre-paid debit cards, introduced in 2003, are a great success with around 7.2m in use.

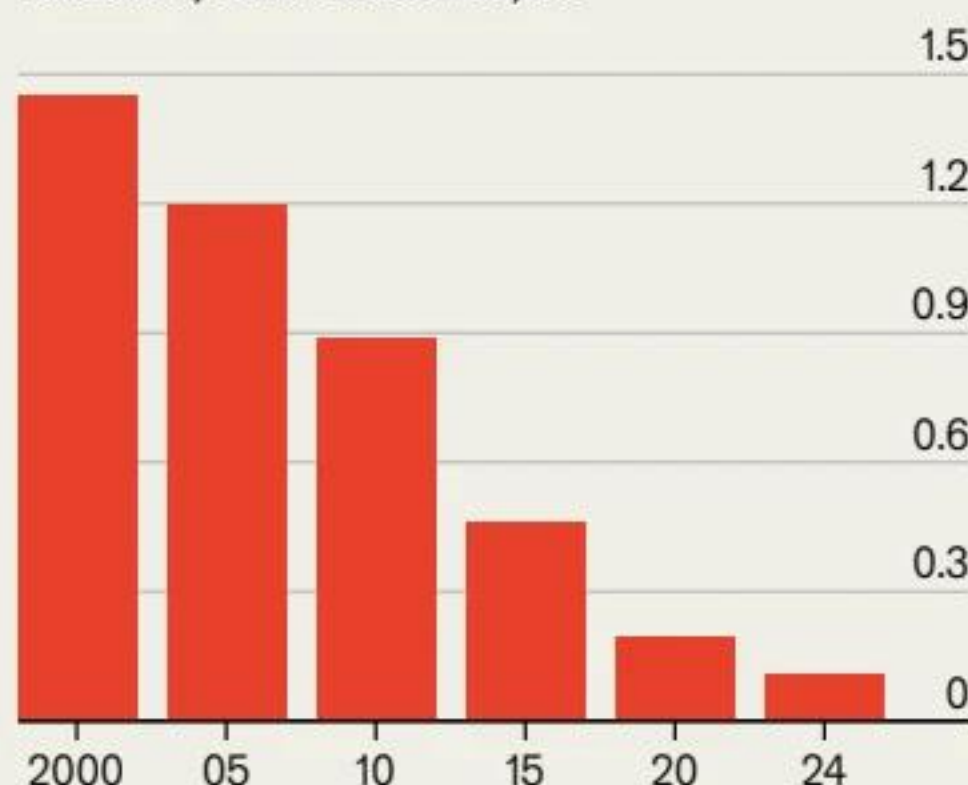
Germany's Deutsche Post DHL group, a listed company whose biggest shareholder is Germany's state-owned development bank, is also profitable, and was voted the world's best postal service alongside Switzerland in 2024. After privatisation in 1995, Deutsche Post reinvented itself as a logistics company that also provides freight and supply-chain management services (warehousing and distribution). Britain's Royal Mail, though partly privatised—its majority owner is Daniel Kretinsky, a Czech entrepreneur—has not done as well. In August it reported an operating profit for the first time in three years; after including the cost of voluntary redundancies, it still made a loss.

Many state-owned carriers, meanwhile, are suffering. On November 3rd the loss-making Greek post office closed 204 of its 456 branches. That caused a nationwide outcry, with opposition politicians arguing that it is vital for social cohesion and for reaching elderly Greeks in remote areas. Workers at Canada's state-owned post have been striking, on and off, since September, in a dispute over wages, benefits and job security. The United States Postal Service (USPS) serves the world's largest single market: North America accounts for 37% of global postal revenue. It reported a \$9bn annual loss on November 14th, and its cumulative losses since 2007 come to more than \$100bn. Donald Trump has called the service "a joke" and is reportedly considering folding its 635,000 workers into the Department of Commerce.

Letters are not dead yet. "The rate of decline of the volume of letters differs according to the level of digitisation of a country," says Armen Ghalumyan of Cullen International, a research firm. They still account for a substantial portion of postal

My baby just wrote me a text

Denmark, letter deliveries, bn



Source: PostNord

revenue. Until recently India and Brazil still had rising volumes of letters because of their growing middle classes, according to the Universal Postal Union (UPU).

Denmark, however, is among the most online of countries. In 2024 the United Nations ranked the digitisation of its public sector best in the world, for the fourth consecutive year. "The letters market is no longer profitable," according to Kim Pedersen, PostNord's chief executive. The fewer sent, the higher the unit cost of handling them.

Others will follow Denmark, predicts Henrik Ballebye Okholm of Copenhagen Economics, a consultancy—not immediately, but perhaps in a decade. Danes will still be able to send letters (or get them from abroad) via DAO, a private company, but they will have to go to a DAO branch. Bright red post boxes with a post horn and the Danish crown have adorned the country's streets since the mid-1800s. From next year, they will be adorning its museums. ■

Turkish football

Tilting the pitch

ISTANBUL

A gambling scandal hints that Turkey's football is as corrupt as its politics

HOW MUCH does a red card go for in Turkish football? According to Ozgur Ozel, an opposition politician, 5.5m lira (\$130,000). That was the size of a bet he alleges was placed on a player for Goztepe, a club from Izmir, being sent off during a game on October 26th. The wager allegedly paid off when the player was given a red card, to angry howls from the club's fans. Turkish authorities are investigating.

A day later, the howls spread across Turkey, after an audit by TFF, the country's football federation, revealed evidence of widespread sports gambling by referees. The federation has since banned 149 referees and 1,024 players suspected of betting on matches. Police have detained at least 19 people, including the chairman of Eyupspor, a team in Turkey's top league.

The scandal is Turkish football's biggest in years. The TFF's president, Ibrahim Haciosmanoglu, said at least 371 of the 571 referees in Turkey's professional leagues had accounts with betting websites. One had placed more than 18,000 bets. Ten others had placed over 10,000 each.

Referees in Turkey have a dubious reputation. José Mourinho, the short-tempered Portuguese manager who coached Fenerbahce, another top team, during the 2024-25 season, said he would not have taken the job, had he known the state of officiating there. Two years ago the president

Marriage laws

A convenient fairy tale

COPENHAGEN

Denmark draws international weddings mainly because of a lack of red tape

AT FREDERIKSBORG CASTLE chapel, outside Copenhagen, couples may wait two years for a wedding date. A three-hymn limit is in place to keep ceremonies short. The chapel hosted the wedding in 1995 of Denmark's Prince Joachim and Alexandra Manley, a Hong Kong-born businesswoman. That made it attractive to people who "travel, find love and want to marry", as Henrik Winther Nielsen, the vicar, puts it.

Combining travel and nuptials has been a boon for Copenhagen, which has become a destination-wedding spot less for its charm than for its liberal marriage laws and speedy digital registration system. In 2024 the number of foreign couples getting married here rose to 5,400, more than double that in 2019. Wags call it the Las Vegas of Europe.

In most European countries getting hitched is easy if both partners are citizens, tricky if one is an immigrant and baffling if both are foreigners. In Italy both parties must submit a smorgasbord of paperwork from their home countries for translation and multiple rounds of approvals. Recently divorced women must show proof they are not pregnant. In Germany lovebirds whose German is not fluent must use an approved interpreter to meet with officials, and can be asked for documents—six months old or less—that might not even exist in their home country.

For Alexander and Katerina, a Russian-Ukrainian couple living in Germany, it was too much. They wound up tying the knot last August at Copenhagen's imposingly ornate brick city hall. So did a Salvadoran woman and her Italian boyfriend, who flew in from their home in Dublin. They were unable to marry in Ireland because she had lost her

birth certificate; Copenhagen required only a passport.

Rasmus Clarck Sorensen, co-founder of Getting Married in Denmark, a wedding agency, has seen his clientele rise from ten a month in 2014 to 250 a month now. Comparisons to Las Vegas are overblown, he says: "No one can walk into a town hall tipsy and get married." How they walk out is another matter. Copenhagen city hall's tourist shop sells champagne flutes, sparkling wine and bouquets. Such is the demand that local couples find it hard to get wedding slots, touching off a new front in the country's nativist political trend. Since October 40% of the ceremonies at city hall have been reserved for Copenhageners. Some Danes advocate another way to ease the burden: a wedding tax on foreigners.



To have and to hygge

of Ankaragucu, an Ankara club, was banned from the sport after punching a referee in the face. And Mr Haciosmanoglu has his own history of dust-ups. A decade ago, during a game involving a team of which he was president, he became so incensed with the referees that he had them locked in a room in the club's stadium. They were released only after a phone call from Recep Tayyip Erdogan, Turkey's football-mad president.

Once the scale of the gambling scandal

became clear, Mr Erdogan said Turkey "must do whatever is necessary" to clean up football. Fans hope the courts show the same zeal in pursuing crooked referees as they do in bringing down Mr Erdogan's political rivals. On November 11th prosecutors formally indicted Ekrem Imamoglu, the main opposition candidate in the next presidential elections, on 3,900 pages' worth of trumped-up charges. Mr Imamoglu has spent the past nine months behind bars. He now faces up to 2,352 years. ■

CHARLEMAGNE

The great de-galvanisation

If the fighting ends in Ukraine, the infighting in Europe will begin



ONE THOUSAND THREE HUNDRED AND SEVENTY-TWO days into what was meant to be a three-day war, is peace finally in sight for Ukraine? Who knows. A flurry of amateurish diplomacy between America and Russia in the past week has yielded much sound and some fury, notably from Europeans irate at being left on the sidelines of another set of peace talks. But for now there is little in the way of a truce. Ukraine has probably done well to sidestep the dodgy deal originally cooked up between the Kremlin and the White House. Still, one day, and hopefully soon, an agreement to end the war that both Ukraine and Russia can accept will be found. That will be a moment of intense relief. Yet at the same time, for Ukraine's European neighbours, it will have some awkward consequences. War has galvanised the continent. When war ends, watch out for the effects of the great de-galvanisation.

Nearly four years of fighting on its doorstep have given Europe, often a fractious continent, the closest thing to national unity it has ever known. The visceral reaction to Russia's butchery on the battlefield sent a shock wave of shared purpose across the continent; a feeling that the world had changed swept from Scandinavia to the Mediterranean. Some transformations happened at the national level, notably the German *Zeitenwende* that ditched what remained of its post-war pacifism. But the war also put the union in European Union. Acting in concert, its 27 member states gave refuge to millions of Ukrainians, found weapons and money to donate, and offered their neighbour the prospect of accession to the club, all while imposing 20 rounds of sanctions on Russia. (The EU even found ways to work constructively with Britain.) Sometimes the union has fumbled. Often it has been too slow. But in Volodymyr Zelensky's darkest hours the Ukrainian president found comfort in meetings of EU leaders in Brussels.

This unity (apart from Hungary) has been inspiring, but is unlikely to survive a peace intact. For countries on the eastern flank of the continent, such as the Baltics, Finland and Poland, a ceasefire in Ukraine would stir as much anxiety as relief. From their vantage point, the war's end will free up Russian resources for another campaign—possibly against them. Ukrainian soldiers have since 2022 been a bulwark against Russian aggression, but might then

be demobilised. Much of the continent's eastern half would thus want Europe to isolate Russia yet more firmly. Many in its western half, in contrast, crave normality. With the war over, they would ask whether Europe *really* need spend all that money on defence. Peace, to them, would offer a chance to return to the status quo. These views would struggle to coexist within a single union.

To make things trickier, one of the objectives of the mooted peace, being negotiated largely over Europe's heads, is to allow Russia back into the fold in some way. The original 28-point plan devised by Russia and America envisioned it returning as a member of the G8, for example. The plan also called for dropping sanctions, most of which have been imposed by the EU. That would play into the hands of those in Europe who think commercial ties with Russia should be resumed sooner rather than later. The battle lines would be drawn not merely across the continent's map, but within its parliaments. Europe's populist-right parties tend to be friendly towards Russia, but they would not be alone. It would not be long before, say, business interests in Germany propose improving Europe's competitiveness on energy prices by gradually resuming imports of piped Russian gas to households and factories—at least in small quantities. Furious Poles and Estonians might denounce this as treason against Europe.

How to deal with Ukraine will be another source of division in the event of a peace. The country is unlikely to be in a good state. Europe does not want a basket case on its doorstep. But sympathy for Ukraine at war may not carry over to Ukraine at peace. If and when the fighting stops, questions will arise over whether Ukrainian refugees greeted with open arms in 2022 should not return home. And who will pay for reconstruction? Europe's plan hinged in part on using over €100bn (\$116bn) of the Russian assets frozen in EU financial institutions to keep Ukraine afloat. But the 28-point plan indicates that America wants a share of those spoils—and of the business opportunities in Ukraine's reconstruction. Thorny questions will also be asked about whether to keep Ukraine on the path to EU accession, particularly in light of its latest corruption scandal. The main argument for promising Ukraine membership in the EU was to boost its wartime morale. Cynics will argue that in peacetime that is no longer needed.

Divided we fall

But the most wrenching disagreement will come around how to deal with America. Few Europeans keeping abreast of Donald Trump's presidential antics think the transatlantic alliance is as reliable as it once was. The debate on how to wean the continent off American security guarantees is not new. France's Emmanuel Macron deemed NATO "brain-dead" even before the war, and has long wanted the continent to develop greater "strategic autonomy". Central and northern Europeans are more amenable to such pleadings than they once were, but are still wary of alienating the military hegemon that has buttressed their freedom for decades.

The debate over whether Europe should remain bound to America has been stifled while the hot war rages. Europeans have swallowed their pride, for example agreeing in July to a lopsided trade deal. They winced when Mark Rutte, NATO's secretary-general, called Mr Trump "Daddy". But what else could they do, when losing the support of America's petulant president could spell disaster for Ukraine? There is a degree of humiliation a continent at war must endure. When the fighting in Ukraine ends, some Europeans may decide that the bowing and scraping is over. ■

Britain



The budget

Party first, country second

Labour's budget prioritised short-term survival over the painful choices needed to revive Britain's economy

BRITAIN'S CHANCELLOR devoted much of her budget speech to lambasting the previous government. "The Conservatives crashed the economy," thundered Rachel Reeves, accusing them of "time and time again" ducking "necessary reforms" (see box in this section). Labour, she insisted, is different: it is prepared to make the choices needed to revive growth. Sir Keir Starmer has similarly clothed his actions in the language of service. "Country first, party second", he reminded Labour Party members in 2024. "That isn't a slogan. It's the foundation of this project."

Yet the budget did what the government has done since coming to power: put party before country. The Office for Budget Responsibility (OBR) gave a sunnier-than-expected outlook for the public finances, raising its deficit forecast for 2029-

30 by only £6bn (\$7.9bn, or 0.2% of GDP). Ms Reeves could have used this windfall to ease tax rises and launch supply-side reform. Instead, she produced a vintage Labour tax-and-spend package: £26bn in tax increases in 2029-30 and £11bn in extra spending. Worse, the taxes are back-loaded whereas the spending starts now, mean-

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ing higher borrowing in the short term. Most damagingly, the budget dodged the reforms needed to lift growth.

The OBR's forecast underlines the need for more urgency on growth. It has cut its projection for average real GDP growth in 2026-29 from 1.8% a year in March to 1.5%, largely because of weaker expected productivity growth—a bleak continuation of Britain's record since the global financial crisis of 2007-09. The only reason this gloom did not create the £20bn-30bn fiscal hole previously feared is that the composition of nominal GDP has shifted. Inflation is now expected to be higher, and more of the growth is to come from real wages rather than profits. Because earnings are taxed more heavily than corporate profits, this delivers a bigger-than-expected revenue boost. In short, the government was spared by luck, not a stronger economy.

Ms Reeves's budget is not all bad. Unlike last year's effort, it should not be inflationary. That, and the absence for the most part of actively harmful policies, meant that the market reaction was muted. Yields on ten-year gilts fell slightly. Businesses will be relieved that the event itself proved calmer than the lead-up. Ms Reeves was fortunate that the day's most amateurish

moment was not of her making but the OBR's, when it mistakenly published its forecasts before she began her speech.

But avoiding a bond-market tantrum is hardly enough. A better yardstick is whether the budget contained policies capable of delivering the results Ms Reeves claimed to be aiming for. "I will grow our economy through stability, investment and reform," she declared. Yet in three crucial areas Ms Reeves revealed a preference for short-term political expediency over the hard choices required for growth.

Start with stability. Ms Reeves has two fiscal rules meant to signal prudence: net public financial debt must be falling as a share of GDP in 2029-30 (the investment rule), and day-to-day spending must be covered by tax revenues (the stability rule). The easiest way to achieve stability is to create plenty of headroom. That would prevent a repeat of this year's fiasco, when speculation about possible tax rises to bring the finances back in line dampened business confidence and investment.

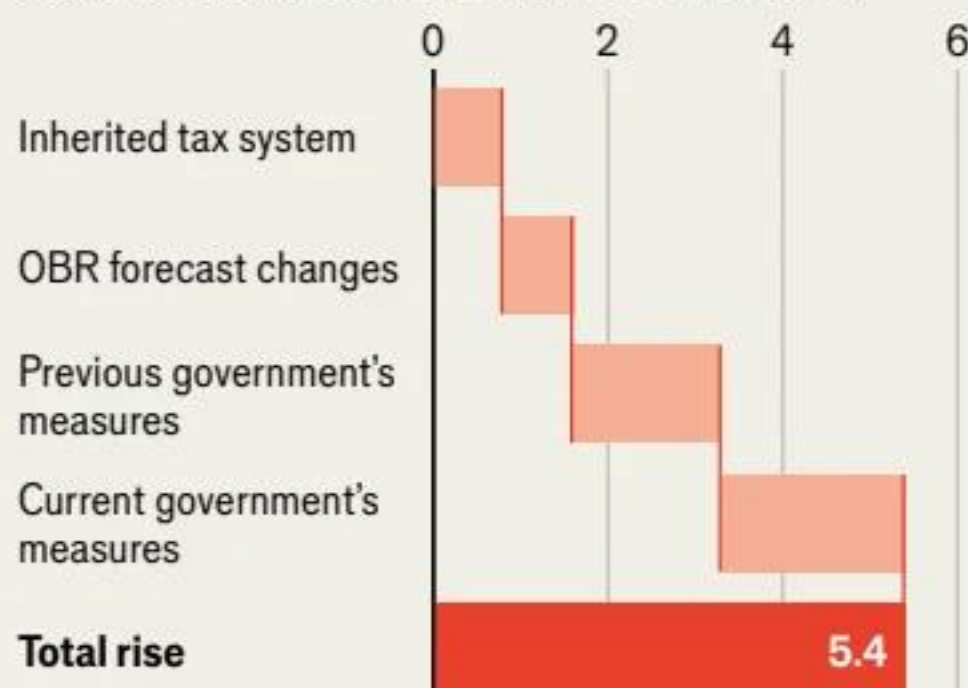
Ms Reeves boasted that she had doubled headroom against the stability rule from £9.9bn at the last budget to £21.7bn. While this is welcome, it is still only three-quarters of the average margin set by previous chancellors. The OBR reckons she has a 59% chance of meeting this rule—little more than a coin toss (see chart 1). A government serious about stability would have used the OBR windfall to build a truly robust cushion (say, £30bn).

Second, Ms Reeves underwhelmed in how she decided to fill the funding gap. A country-first budget would have tackled head-on the fact that Britain's spending levels are unsustainably high relative to the quality of the services the state provides. In 2029-30 spending is forecast to be 44.3% of GDP, five percentage points greater than before the pandemic. This will lead to taxes reaching 38.2% of GDP in 2029-30, the highest levels since the 1940s (see chart 2). That will weigh on private investment and thus growth, especially given that most of the increase is going on day-to-day spend-

The wrong kind of growth

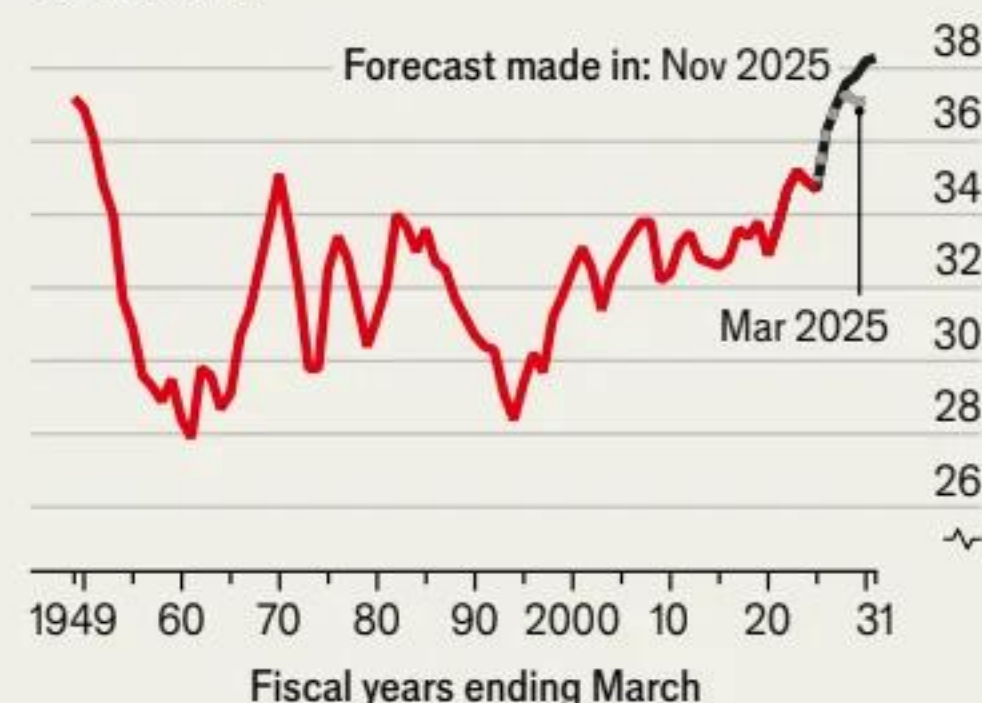
Britain, % of GDP

Causes of tax rise from 2019-20 to 2030-31



Source: OBR

Tax revenue



ing rather than public investment.

The chancellor used the budget to announce yet more giveaways. The biggest was the abolition of the two-child limit on means-tested welfare payments, which costs £3bn a year. While this will lead to a welcome reduction in child poverty, a fiscally responsible chancellor would have paired it with reforms to tackle rapidly rising spending on disability benefits and pensions. Instead, Ms Reeves did the opposite, spending £7bn in 2029-30 on reversing her previous attempts to ration disability benefits and winter-fuel payments.

A glaring gap on growth

Rather than taking serious steps to control spending, the budget focused on tax rises to make the fiscal arithmetic add up. The biggest was freezing the thresholds at which different rates of income tax kick in, raising £12.7bn in 2030-31. The burden mostly falls on lower and middle incomes. While this clearly contravenes Labour's manifesto promise not to raise tax on "working people", it is not the worst way to raise revenue. It is broad-based, meaning the pain is spread widely, and it recognises that the wages of average earners are one of the few things that are lightly taxed in Britain by international standards.

Other tax grabs will be more sinister in their effects. Consider the decision to limit the pension contributions that can be made via salary-sacrifice schemes. There was previously no limit on such contributions, but this measure will raise £2.6bn in 2030-31 by making national insurance payable on contributions over £2,000 per person. Such a rise will discourage savings, which are key for people's personal finances and boosting domestic investment. The policy will further increase taxes on employers (who also pay national insurance). It is a quintessentially anti-growth measure, which should have had no place in a pro-growth budget.

The final, and most worrying, shortcoming concerns Ms Reeves's actions to

boost growth. The chancellor claims to prioritise growth above all else; in her speech she called it "the engine that carries every one of our ambitions forward". Yet her speech provided little fuel for this engine.

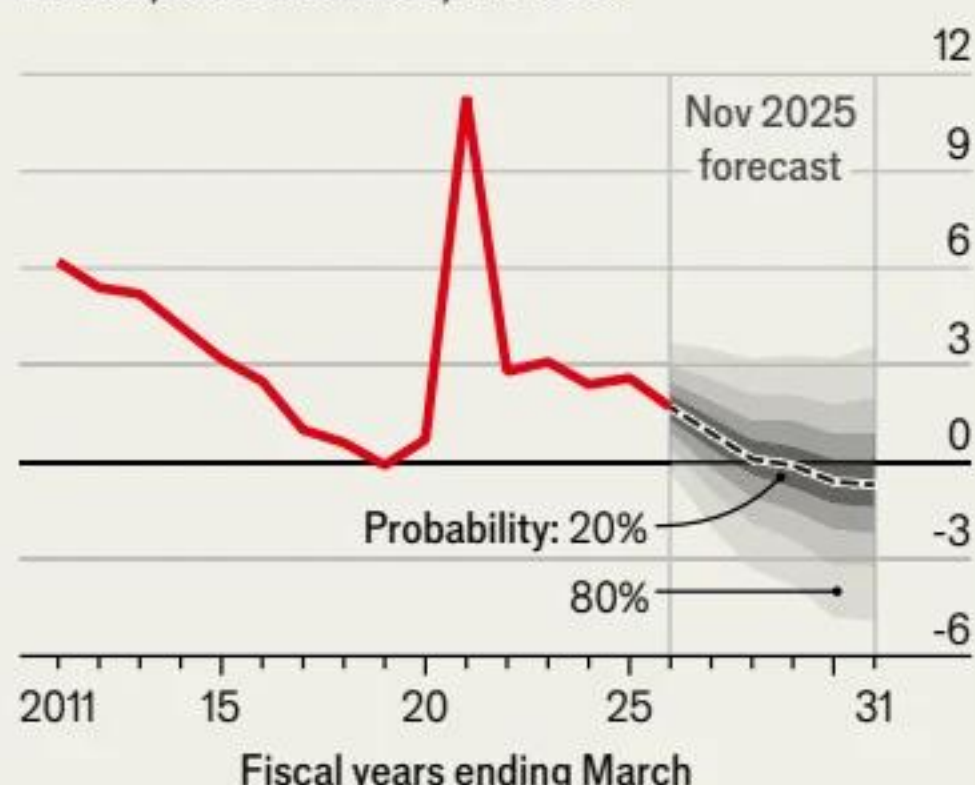
A lack of serious tax reform was the biggest missed opportunity. Britain's complex tax system disincentivises enterprise at every turn. Marginal tax rates of 62% encourage those earning £100,000 a year to go part-time. Stamp duty on housing makes it less attractive for people to move to areas with more productive jobs. Lower taxes for self-employed people discourage people from joining a company, even when doing so would be more efficient. A chancellor who was serious about growth would tackle these perversities. Yet, with the notable exception of road pricing (see next article), there was little attempt at tax reform at all.

This lack of ambition on growth can be seen across the board. Ms Reeves mentioned no new initiatives to strengthen UK-EU trade, despite acknowledging the damage caused by Brexit. She praised the government's migration reforms, yet new policies that restrict access to permanent residency will discourage economically useful immigrants. Labour's employment-rights bill, meanwhile, is actively anti-growth, making the labour market more inflexible and employers less willing to take a chance on new people.

Ms Reeves's budget satisfied the bond market and its spending giveaways will quell Labour's restless backbenchers. Yet it undoubtedly put the country second. The chancellor's inability to make difficult decisions on spending, tax reform and growth will do nothing to arrest Britain's managed decline. Most concerning is the impact her budget will have on trust in politics. Only 12% of Britons now trust the government to put country before party most or all of the time, down from 47% in 1987. A budget that claims to put country first but does the opposite will only deepen the public's cynicism. ■

Borrowed time

Britain, current deficit, % of GDP



Source: OBR

Electric vehicles

One honk for Rachel Reeves

Britain will tax electric cars more heavily. Good

RACHEL REEVES'S budget on November 26th was an uninspiring finger buffet of immediate giveaways and medium-term tax hikes, which will do little to improve Britain's fragile public finances or growth prospects. In just one area she showed what budgets should be for, by announcing a bold tax reform that improves the country's long-term fiscal sustainability.

From 2028 the drivers of electric vehicles will be subject to a crude form of road pricing. A levy will be charged at three pence (\$0.04) per mile for fully electric cars and half that for plug-in hybrids. A driver who puts in 8,000 miles a year, as is normal, will pay £240, the Treasury says. Electric vehicles will remain more attractive than those powered by petrol and diesel, which cost drivers some £480 per year in fuel duty. The levy will raise £1.9bn for the Treasury by the end of the decade.

About time too. For years budget wonks have warned that the rise of electric cars and the death of the internal combustion engine would gouge a hole in the public finances. Forecourt taxes account for a big chunk of government revenues, raising £24.4bn in 2024-25. The Office for Budget Responsibility expects revenues to collapse from 0.7% of GDP today to just 0.1% by 2050-51. The new scheme will fill around a quarter of that shortfall, the watchdog said (vans and lorries will be exempt).

That will doubtless change in the years to come; the rate and scope of the levy is sure to increase. But consider it the start of a journey. What matters for now is that the principle that all road users should chip in has been established. It is best to introduce a new tax regime early, while electric cars

are still a minority on the roads and their keepers are not too powerful a lobby.

Road pricing seems to be popular compared with other forms of motoring tax (Ms Reeves, like many of her predecessors, has again chosen not to increase fuel duty). Fully 71% of the public think that electric-car drivers should pay some tax, with only 14% saying they should pay none at all, according to polling by Stonehaven, a consultancy. Left-leaning voters tend to think that greener cars should have preferential tax treatment, whereas right-leaning ones think they should pay the same as petrol and diesel ones.

Opponents of road pricing have previously cited privacy concerns, arguing it would require cars to be tracked by the government. Not so, insists the Treasury: drivers would pay for an estimated year's driving up front and settle the balance at

the end of the year. Drivers' declarations of mileage would be checked against the records of MOT vehicle inspections, as happens in New Zealand. Although in theory drivers could one day opt to share their car's telemetric data automatically, this will never be mandatory, ministers say.

The big risk is that the tax chills car sales. Government targets specify that electric vehicles should account for 80% of overall sales by 2030. The OBR reckons that the new levy would result in 440,000 fewer sales over the next five years, although this will be mostly offset by more generous incentives for car purchases announced by Ms Reeves. But if it works, it will be a rare victory: a tax reform that is radical, popular, creates good incentives and is likely to improve the health of the public finances for decades to come. What a pity that this government has had so few of those. ■

Budget bluster

The mudslinging metric

Our analysis of 50 years of chancellors' speeches

BEFORE THE budget on November 26th Rachel Reeves, the chancellor, said that she would not "spend her time gazing into the rear-view mirror" because "to blame the hand you're dealt is a dereliction of duty". During her 64-minute speech in the House of Commons, did Ms Reeves stick to her word?

To find out, we took the transcript of Ms Reeves's budget speech—as well as every other budget and significant fiscal event since 1974—and asked OpenAI's large-language model to analyse each speech, returning a battery of quantitative and qualitative variables. (Among the best jokes is Jeremy Hunt's quip in 2023 that "British ale is warm, but the duty on a pint is frozen.")

Ms Reeves did not keep this particular promise. Her list of complaints included that her Conservative predecessors "crashed the economy...lost control of debt" and that "Tory austerity left classrooms crumbling and [hospital] waiting lists sky high."

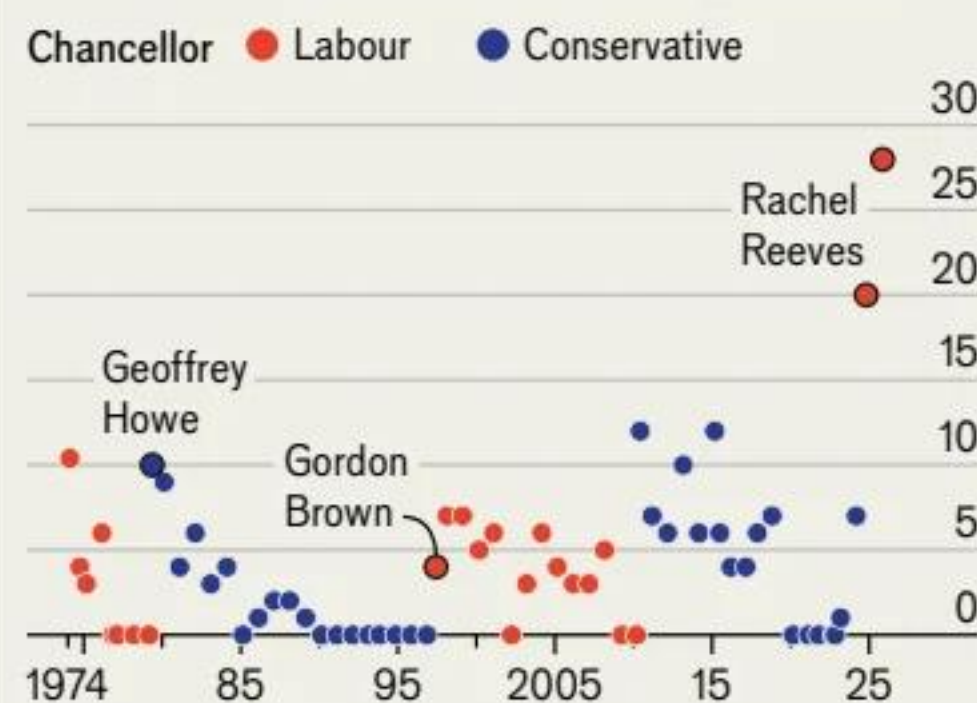
Our AI analysis identifies 28 instances where the chancellor blamed the previous administration. That is even more "mudslinging" than during her maiden budget speech in October 2024, when she blamed the Tories 20 times (more than any chancellor in our analysis). Contrast that, for example, with the relative magnanimity shown by Geoffrey Howe in 1979, after the country had been

bailed out by the IMF. He blamed the previous government just ten times during his maiden speech.

Other political parties were not spared Ms Reeves's opprobrium. She implied that Mr Farage, the leader of Reform UK, which has a 11-percentage-point lead over Labour in the polls, was a "Russian asset". She also reminded Parliament that Zack Polanski, leader of the Green Party—which is now polling better than Labour among 18- to 34-year-olds—once had a career as a rather dubious hypnotherapist. No sooner had she sat down, however, than the chancellor faced a barrage of mud from opponents about her own economic mess.

Blame game

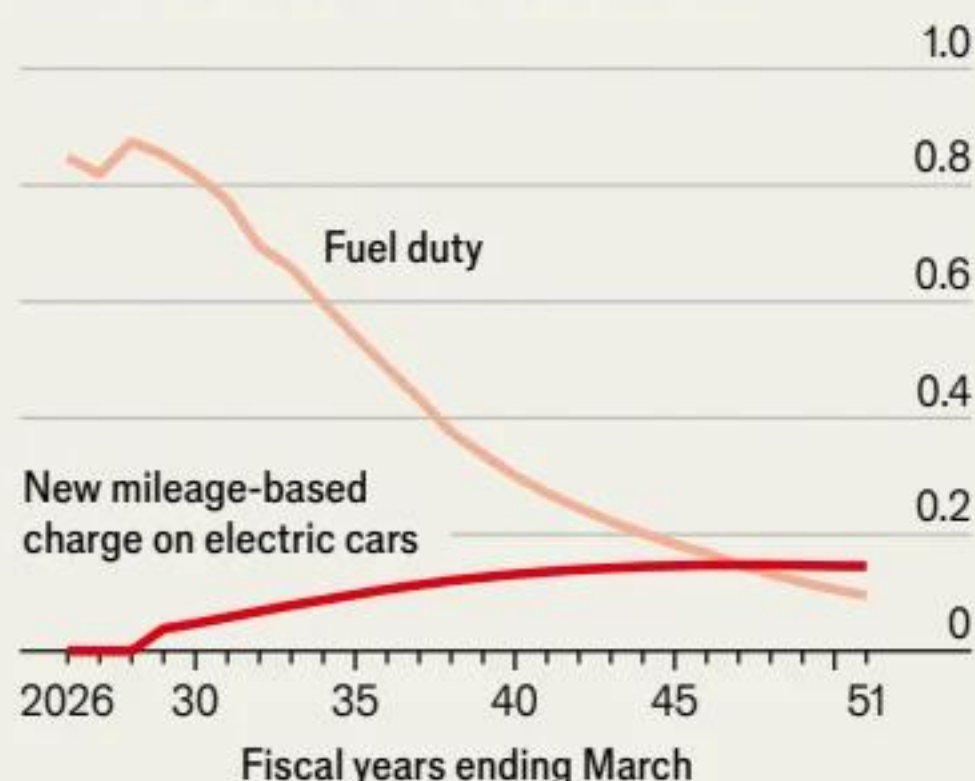
Britain, transcript analysis of budget speeches
Number of times previous government is blamed



Sources: Hansard, House of Commons Library; OpenAI; The Economist

Weak batteries

Britain, forecast tax revenue, % of GDP



Source: OBR

BAGEHOT

The left-wing government is left-wing

An obvious fact. But still an overlooked one



THEY BAYED, they hollered, they hooted, they cheered. After a miserable 18 months, in which they had ranged from dejected to mutinous to feral, Labour MPs finally had something to shout for when Rachel Reeves, the chancellor, unveiled a straightforwardly left-wing budget. A mansion tax was once a terrifying spectre of life under Ed Miliband. Now it is government policy. “I think if you have a house that is worth £5 million, then you can probably afford it,” said Ms Reeves. The two-child limit on benefits, which keeps 300,000 kids in poverty, was scrapped. Spending up. Taxes up. Borrowing up. Labour MPs: cheered up.

The budget was further proof of a strangely overlooked fact in British politics: Ms Reeves is a chancellor in the most economically left-wing government of the past five decades. Forget this budget. Consider the last one. Ms Reeves raised taxes more than any chancellor in several decades. She also launched a gargantuan amount of spending. Across two budgets, Ms Reeves increased taxes by almost £70bn (2% of GDP). At the same time, she has pledged about £80bn of extra spending. The tax-and-spend party has taxed and spent.

Nor is this leftward charge limited to fiscal policy. Private schools have been taxed. Railways will be nationalised. Ms Reeves sits atop a government that has pledged to spend £4bn a year on council housing. It handed £23bn over two years to the National Health Service (NHS), with few strings. (Business would pay, naturally.) Under Labour the minimum wage—now £26,400 a year for a 40-hour week—has reached a point where a grad-schemer working late at a Big Four firm can earn less per hour than the person cleaning their office. *¡Viva la revolución!*

Yet after all this, Labour is unpopular. More specifically, it is haemorrhaging support to its left. For each voter who drifts right, two more head to other progressive parties, such as Zack Polanski’s surging Greens. How has the most left-wing government in a generation ended up in such a mess?

In opposition, Labour claimed it would not be a bog-standard, centre-left government. It promised technocracy; before the election Ms Reeves hailed “modern supply-side economics”, rather than tax-and-spend. It would offer a rewiring of the state. The re-

ality is less profound. Breakfast clubs will be rolled out across the country at a cost of £400m. Leviathan will now shove cornflakes down a seven-year-old’s gullet.

Oddly, left-wing policy generates protest, not praise, from the left. Employment rights will soon be overhauled. Overnight, employers will change from having two years before unfair-dismissal rules apply to new hires, to one day. Anti-union legislation from the David Cameron era will be scrapped. It is so sweeping even the Resolution Foundation, a centre-left think-tank, has called for restraint. Yet some will not take the win. Sharon Graham, the general secretary of Unite, Britain’s biggest union, treks from studio to studio grumbling about the Labour government.

The botched political strategy of Ms Reeves and her boss, Sir Keir Starmer, created a strange impression of the government. Punching the left, even while pursuing an avowedly left-wing economic strategy, was seen as wise politics. It was for this reason that policies such as the two-child limit on benefits stuck around. It was a policy to look austere; to look hard; to look less left-wing. Now Labour is a party happy to look soft, generous and as left-wing as it has always longed to be. The result? Sir Keir’s government has achieved the rare alchemy of being loathed by the right, yet scorned by the left for being a bunch of closet Tories.

Under Labour Britain has a fast-bulging state. But what does it have to show for it? Policy takes a while to bite. When a government is dishing out pain, such as during the austerity years, this is a positive; when a government is trying to spread pleasure, it becomes a weakness. Gigantic spending on the NHS is yet to translate into much improved performance. Even if councils have extra money, Britain’s public realm is still exhausted. The state has never been so expensively funded, yet seemed so tired.

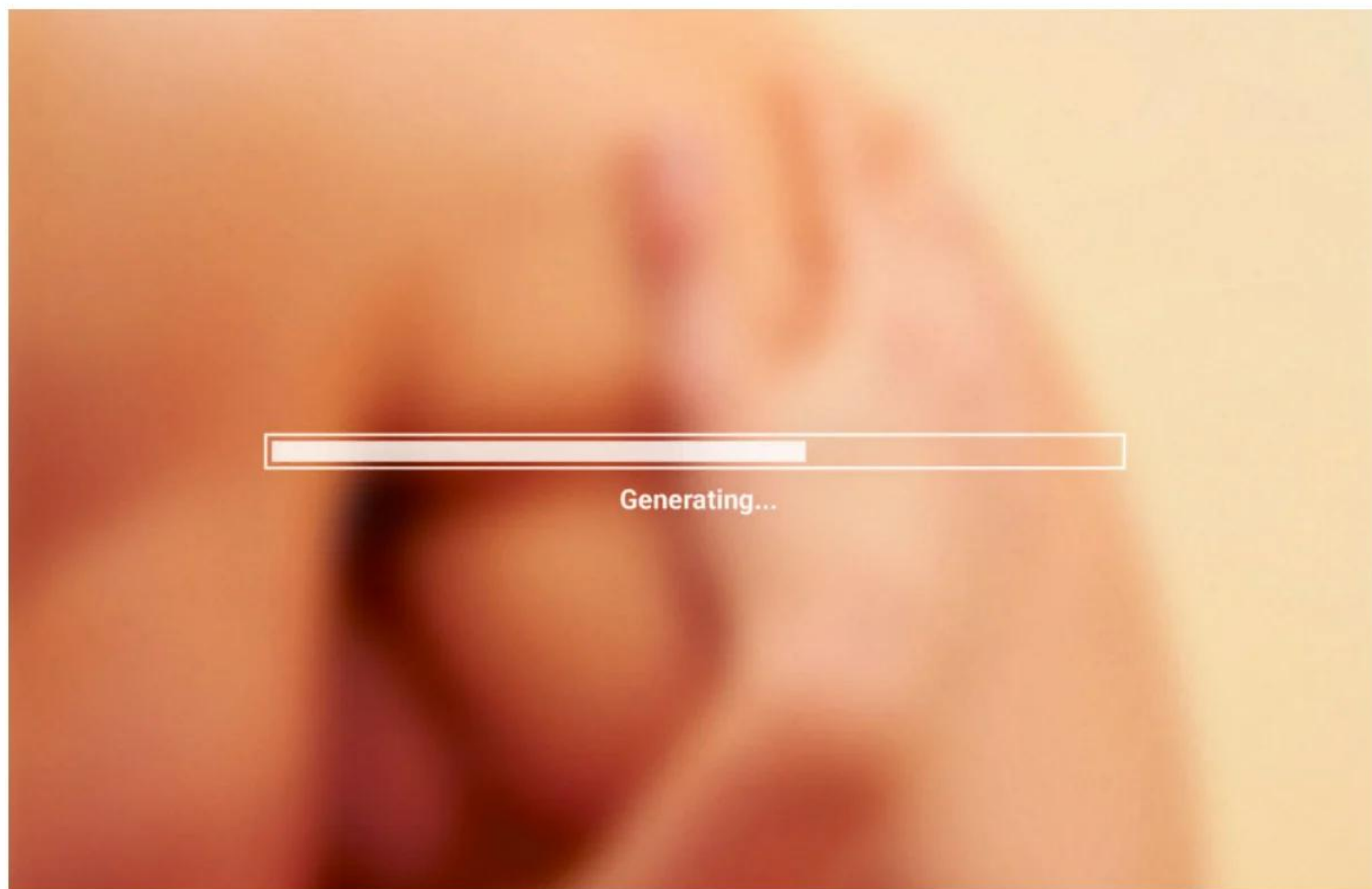
Attempting social democracy in the current economic environment is a miserable, frustrating endeavour. For all that Ms Reeves and her fellow ministers are more left-wing than they admit, they do—just about—operate within Britain’s fiscal constraints. No such rules apply to the “ordinary hope” offered by Mr Polanski of the Greens, who pledges socialism at little cost for anyone other than the super-rich. Even a once-in-a-half-century government tax-and-spend splurge seems fiscally frigid in comparison.

Can I shock you? I’m actually very left-wing

Most fatefully, it is only on the economy that Labour can claim to be left-wing. When it comes to social issues, such as cracking down on asylum-seekers, the party drifts right. Left on the economy and right on culture is, supposedly, a cheat code for the British electorate. Labour’s polling—which, at 18%, edges to fascinating new lows—reveals it is anything but. People who are left-wing on the economy tend to be progressive; those who are economically right-wing tend to be conservative, points out Ben Ansell of Oxford University. Labour is chasing a voter who barely exists.

Labour is beginning to admit what it always was: a normal, centre-left party, which would put up taxes and spending in a bid to make Britain better. Did Ms Reeves, who had a picture of Gordon Brown on her wall at university, truly believe that putting children in poverty was wise policy? Sir Keir is a soft-leftist at heart, rather than a hippy-punching hardman. Principles were hidden in the name of political expediency. Now that they are on show, few believe they are sincere. How could they be? Persuading progressive voters to believe in Labour is the task. If Ms Reeves and Sir Keir cannot manage it, perhaps someone else can. ■

International



Silicone valley

AI is upending the porn industry

Synthetic smut will soon be flooding the internet, bringing new opportunities and perils

PORN HAS long been a proving ground for new technology. When Johannes Gutenberg invented the printing press in the 15th century it was quickly deployed to print bawdy pamphlets. Adult films were put on video in 1977, a year before mainstream Hollywood ones, and dominated sales for some time. When Minitel, a French precursor to the internet, was launched in the early 1980s, erotic services initially accounted for between one-third and a half of all traffic. It is a similar story with 8mm cameras, cable television—and now artificial intelligence (AI), too.

Even as many businesses dither over deploying AI, the technology is already being put to work producing smut. Porn sites are awash with AI-generated videos and images. Big AI firms, struggling to make money from their super-smart models and to justify their sky-high valuations, are get-

ting in on the act. xAI's Grok already offers a "spicy" mode capable of generating explicit imagery and video. OpenAI will offer erotica on ChatGPT from December (though only to verified adults). The market for AI-driven adult content will be worth \$2.5bn this year, according to Global Commerce Media, a research group, and it is expected to grow at a constant rate of 27% a year until 2028.

The speed at which AI is being adopted raises existential questions for the porn industry, and for society. Will performers be elbowed aside by algorithms? If synthetic porn becomes ubiquitous, will viewers pay for the real thing? And what of the porn

studios and platforms that dominated the industry for so long? The answers offer a glimpse of how AI might reshape more buttoned-up businesses next. More troubling are questions over the new dangers posed by AI tools that are already being used to sidestep bans on images showing the sexual abuse of children or to produce X-rated deepfakes that feed scams.

For AI firms, the allure of the porn industry is clear: sex sells. In Britain three-quarters of men and a half of all women admit to having viewed X-rated content, according to YouGov, a pollster (and because many people are too embarrassed to confess this to a stranger, the real figure is surely higher). Worldwide, the porn industry rakes in almost \$100bn in revenues every year, twice as much as AI does. Five of the 50-most visited websites in the world are porn sites, according to Similarweb, a data provider. The industry was long dominated by "tube sites", like Pornhub and xHamster, which serve up free videos and make money through ads. More lucrative subscription platforms have emerged that charge users to view content, with added fees for custom content and personalised chat. OnlyFans, probably the best-known, made over \$1.4bn in revenues and \$520m in profits in the 2024 financial year. ►►

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► In the past, each new technology, from videos to internet streaming, has generally gained ground because it reduced the cost of distributing smut. But AI is more revolutionary than evolutionary, because it can produce customised porn on demand. The range of uses this technology can be put to is limited largely by the imagination (and whatever restrictions AI firms will agree to bake into their models). Some AI-porn generators can allow a user to summon an ideal partner—down to skin tone, physique, personality and even their relationship to the user—and have them act out fantasies and provide companionship. (Want nudes of a 92-year-old with an athletic figure who likes reading and has a foot fetish? AI can provide them.) For those who prefer to leave a little to the imagination, there are sexbots that produce text- and audio-based erotica from a few prompts.

Some in the industry speak of loftier goals. Arman Chaudhry, the founder of Unstable Diffusion, an uncensored image generator, likens developers training AI to create porn to art teachers starting with life drawing of nudes. “It’s a great test of how models understand the world and anatomy,” he explains. But this hardly seems the purpose of “nudify” apps, which take images of clothed people and spit out plausible nudes and are troublingly popular among schoolyard bullies.

Rise of the machines

Though the adult industry is poorly tracked, all the signs suggest that AI-generated porn is booming. Google searches for “AI porn generators” and “nudify apps” have increased in the past few years. Indicator, a publication focused on digital deception, tracked 85 “nudify” sites in the six months to May and found they received about 18.5m visits a month between them and made as much as \$36m in the year to May. The ten most popular websites offering AI companions focused on “mating” drew 78.5m visits in the first quarter of 2025, according to a study led by researchers at the Universities of Oxford and Cambridge. Our own number-crunching suggests they received triple the traffic in the three months to October.

AI tools intended for more staid purposes are also being dragged under the sheets. Lauren Kunze, the head of Pandorabots, a chatbot developer that blocks lewd content, observes that the two groups most likely spend hours talking with machines are bored children and people seeking sex. One female character hosted by Pandorabots, Kuki, is propositioned by a third of users and has been told “I love you” 90m times in 15 years. Of all the uses of AI, Ms Kunze says: “Sex chat has the strongest consumer mandate, is easiest to enable and is the most monetisable.”

As in many other industries facing tech-

nological disruption, the effects of change are felt most immediately by the people working in it and legacy firms. Demand for human on-screen talent is unlikely to vanish entirely. In one study published last year in *Cognition and Emotion*, a journal, researchers showed participants images of scantily clad people and asked them to say which they thought were made by AI (spoiler, none was) and then to rate how arousing they found the images. The study found that participants were aroused by what they thought were AI-made images, but less so than those they thought showed real people. “Just like people feel empathy for Anna Karenina or Ned Stark despite knowing they are fictional characters, they can also feel aroused by virtual models,” the researchers wrote.

Still, competing with machine-made porn is getting tougher as the technology advances. Another study, published in *iScience* in 2022, found pictures of synthetically produced faces were more likely to be perceived as real than those of actual people. Another study, published in *Psychological Science*, found that it was particularly hard for participants to identify fakes among pictures of white faces, which are over-represented in AI-training data and in porn. Leo Saros, the founder of Flirtflow, an automated chat service for OnlyFans creators, says AI has improved so markedly in recent months that users almost never realise they are messaging a machine. “It’s a bit like the matrix,” says Mr Saros. “As long as you don’t know you’re in it, you don’t have doubts and you enjoy it.”

Big-name porn stars have most to lose. Fans will inevitably use deepfake technology to graft their faces onto X-rated videos or use their work to train AI tools without their consent. A few stars, resigned to the unstoppable, are choosing to ride the wave by licensing their likeness to AI firms and building avatars that earn tips from fans. For Vicky Vette, who is 60 and who launched a digital double of herself on the

Eva AI companion app earlier this year, it could extend her career in an ageist industry. Bonnie Blue, who made headlines by bedding more than 1,000 men in a day, reckons her porn is future-proof because she interacts with fans online and off. “A lot of it is with strangers and a lot of it is with the public,” she says. “How can you replace that?”

Among amateur actors and models, AI is a useful tool for stripping out drudgery. Rather than working for big porn studios, most now make money directly from fans on subscription platforms. They are porn stars, cameramen, editors and administrative assistants too. AI video generators cut the time it takes to produce a polished two-minute clip from days to hours. Chatbots do the lucrative work of private messaging. Flirtflow, for example, takes 8% of earnings from personalised chats, which is much less than it costs creators to hire real people to respond to fans. “AI lets them grow their business without burning out,” says Alison Boden, the executive director of the Free Speech Coalition, an adult-entertainment industry association, and the former boss of Kink.com, a site that provides what the name suggests.

Robo-school

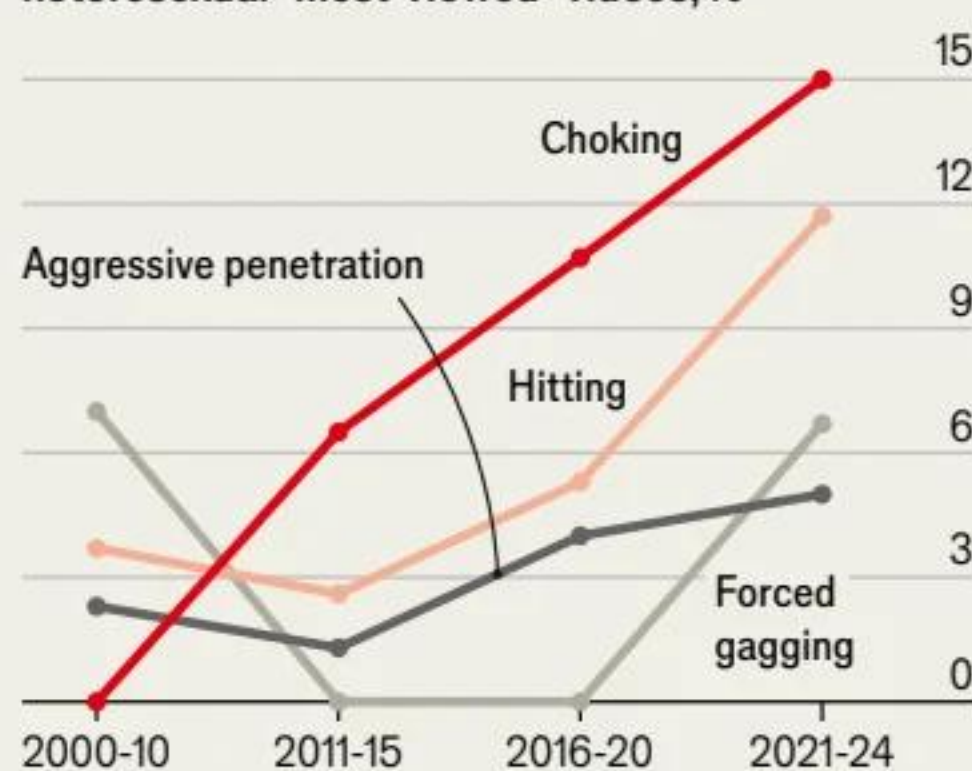
Also affected are the middlemen who have controlled the distribution of porn for generations. Studios, having lost business to subscription sites, face a new risk: that the videos they shelled out vast sums making are quietly being used to train bots. In July Strike 3 Holdings, an American producer of raunchy films, sued Meta, the owner of Facebook, for allegedly breaking copyright rules by training AI models using its films. (Meta denies the allegation.) Lawrence Walters, a lawyer, sees a growing number of porn stars who are demanding riders in their contracts that prevent the studios from using their past work to train a model. “AI is only getting more pervasive,” Mr Walters adds, “so studios have to think: do they want to give up those rights?”

Platforms that host adult content have to make a big decision: whether to allow AI-generated content or not? Depending on how the technology advances, it could be the difference between growing fast and going under. OnlyFans allows content that is machine-tweaked but not fully machine-made. The platform is taking a punt that real-life porn will draw users when the internet is filled to the brim with AI smut. Other sites, such as Fanvue, make much of the fact that they host AI-generated raunch. Amrapali Gan, the former chief executive of OnlyFans, is launching an adults-only social platform called Vylit in December, on which AI-generated content will be clearly marked. “Transparency really makes a difference,” Ms Gan says.

In all, AI promises to vastly increase ►►

More Mars than Eros

Pornhub, prevalence of aggressive acts in heterosexual “most-viewed” videos, %

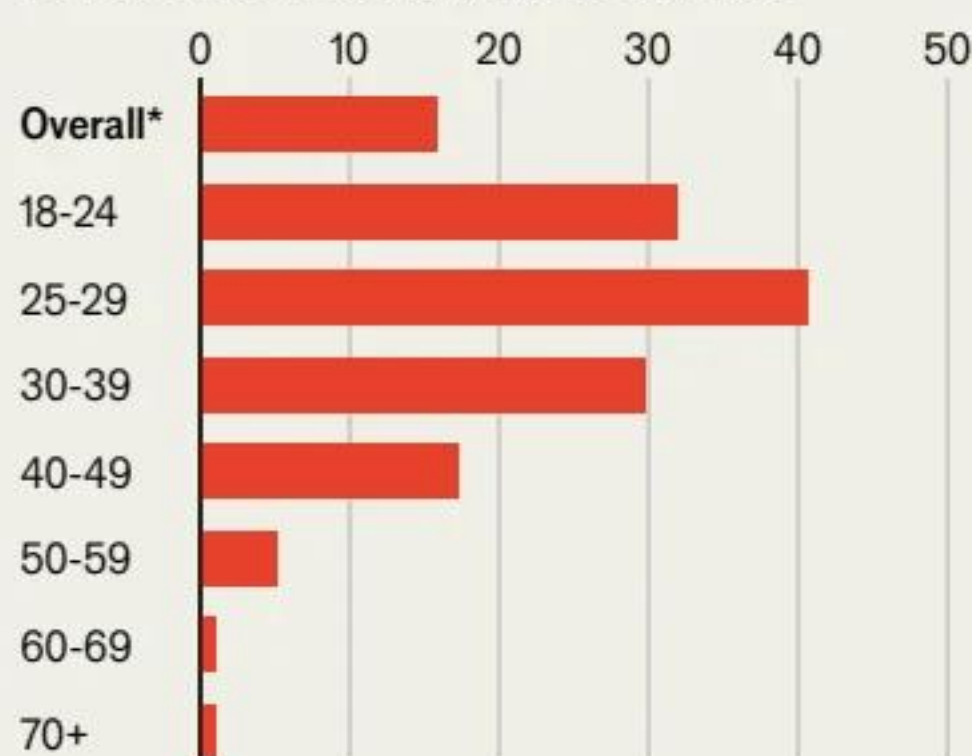


Source: “The rise of spanking, hitting, and strangulation: a longitudinal evaluation of aggression in pornography,” by E. Shor and X. Liu, *The Journal of Sex Research*, 2025

Not waving but choking

2

United States, % of women who report having been consensually choked during sex at some point in their lifetime, by age group, 2022



Source: "Prevalence and demographic correlates of 'rough sex' behaviours", by D. Herbenick et al., *Archives of Sexual Behaviour*, 2025

*4,562 total respondents

alarming increase in the share of young women who say they have been consensually choked during sex. Strikingly, more than 40% of women aged 25-29 said they had been choked by their partners (see chart 2). Though done with their permission, this is worrying, too. Health experts warn that there is no way to safely strangle someone; a person can fall unconscious within seconds of being choked. Earlier this year, the British government introduced new legislation aiming to outlaw porn showing strangulation. "The growth of strangulation practices in mainstream pornography and in the discourse on sexuality may encourage young people to add these practices to their regular sexual repertoire simply because they believe it has become a normal part of the sexual script," noted Professor Shor, drily.

A second concern is deepfake technology, which can turn anyone's likeness into porn. Home Security Heroes, a group that tries to prevent identity theft, reckons it now takes less than 25 minutes to make a deepfake clip from a single clear headshot. The technology made headlines last year when explicit machine-made images of Taylor Swift went viral. Increasingly, the victims are ordinary people. A survey by the Alan Turing Institute, Britain's national institute for AI, found almost one-third of women and one-fifth of men worry about being targeted.

Online scammers are increasingly using deepfake porn to blackmail people or to win their confidence. Reed Amber, a sex worker and the host of the ComeCurious podcast, suspects that material she posts online is being mined to produce convincing images and voice clips in her name. She gets multiple messages every week from followers who have been duped by crooks impersonating her on social media and messaging apps. "Sexuality and sex is such a vulnerable space for people that they will suspend their own belief to believe someone is there desiring them," she says. "This

is preying on the vulnerable."

Regulators are trying various approaches. The European Union's AI Act requires synthetic content that looks authentic to be labelled. America's "Take It Down Act", championed by First Lady Melania Trump, bars people from knowingly publishing X-rated images of children or of adults online without their consent, whether real or machine-made. Denmark plans to give people copyright over their own likenesses. Britain will give AI developers and child-protection groups the power to test AI models to make sure they cannot be used to simulate child sexual abuse. Gabrielle Bertin, a British peer who led a recent review of the porn industry, is petitioning the government to ban nudify apps outright. "Why does someone need a nudify app?" Lady Bertin asks. "It is to abuse and humiliate, generally women."

Policing the internet

Yet porn has wriggled through regulatory nets for generations. And AI is advancing faster than any legislature can. That leaves the industry to regulate itself. How OpenAI will monitor erotic content on ChatGPT remains unclear. Sam Altman, its chief executive, has said only that he will "treat adult users like adults". Most popular sites hire armies of content moderators to catch illegal content before advertisers and payment processors turn on them. Mastercard's and Visa's decision to block payments to Pornhub in 2020 made the card giants the unofficial policemen of porn.

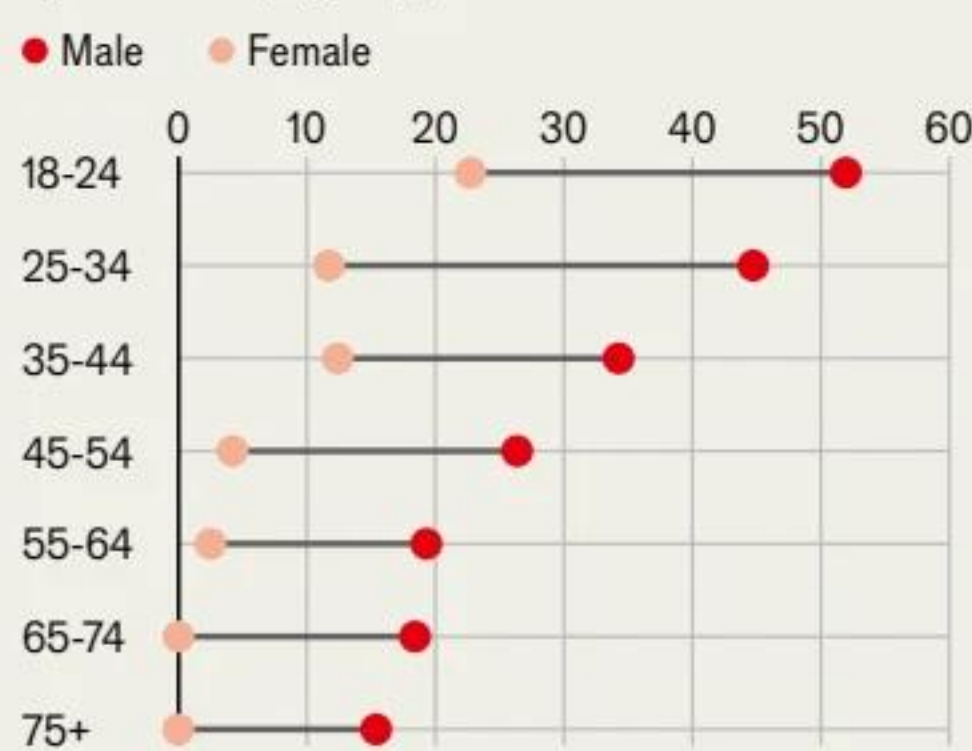
Valérie Lapointe at the University of Quebec in Montreal reckons many users keep their filthiest instincts in check themselves. The public is wary of newfangled chatbots that collect data on their interactions that can be sold or used to target ads. As Ms Lapointe puts it: "If you are the chief executive of a big company, do you really want to risk your data being leaked when you talk to a dominatrix chatbot?"

Pornography has long tested limits and pushed at the outer boundaries of sexuality. Well before AI, anime porn (a Japanese style of animation) was bending bodies beyond biology. A lot of material showing real actors that is sloshing around the web is hardly tame. Yet because AI can make images so cheaply, and allows ever more outlandish scenarios, the web will soon be flooded with increasingly extreme synthetic smut. And as growing numbers of young users have their perceptions warped by AI-porn generators, it becomes all the more important that people are encouraged to hold onto the human connection that, for many, is what makes sex special. As Cindy Gallop, the founder of MakeLoveNotPorn (a website that lets ordinary people share their own sex videos), likes to remind people: "Real-world sex is more surprising and innovative than porn will ever be." ■

Losing my reality

3

Britain, % who report having encountered pornographic deepfake images or videos, by sex and age group, 2024



Source: "Behind the deepfake: 8% create 90% concerned", by T. Sippy et al., *The Alan Turing Institute*, 2024

▶ productivity in the industry. Though this will probably come at the expense of job losses, AI could also free actors from taking risks demanded by viewers, such as performing violent or extreme acts or having unprotected sex at the risk of catching sexually-transmitted infections. Yet the technology may also be shifting risks from actors in front of the camera to everyone else, whether through AI-creation of violent and illegal pornography or through the spread of sexually explicit "deepfakes".

Regulators worry most about AI being used to produce the sort of content that is illegal when it is human-made. The Internet Watch Foundation (IWF), a charity, has found thousands of AI-generated pictures showing the sexual abuse of children being shared online. Reports of such images have more than doubled in the first ten months of this year compared with all of 2024. It seems to be getting increasingly realistic and abusive. Although most AI tools try to block users from making this sort of illegal content, many of the images the IWF found were made by people who had downloaded open-source AI models to their own computers, where they could evade safeguards using coded prompts.

Free-speech advocates might argue that since no children are harmed in the making of these images, they should not be banned. But eroding that taboo could well put real children at risk if it normalises such abuse. There is certainly strong evidence that people have been copying other sorts of aggressive sexual acts that have become more common online. Eran Shor of McGill University in Canada and co-authors have found a startling increase in the prevalence of choking, hitting and forced gagging in the most-viewed pornography videos (see chart 1 on previous page). Too many people are being choked during sex without their consent.

Debby Herbenick of Indiana University and colleagues have also found an

THE TELEGRAM

When a bad peace leads to war

Donald Trump's approach to peacemaking ignores crucial lessons from history



BENJAMIN FRANKLIN once wrote to a friend: “In my Opinion there never was a good war, or a bad peace.” For all his wisdom, the founding father of American diplomacy was wrong. Though the cruelties of war are never “good”, the use of force can be just. More importantly, in a moment dominated by a self-styled peacemaker, President Donald Trump, bad peace deals do exist. That explains the urgent tone of a statement by 15 leaders from Canada, Europe and Japan on November 22nd, urging President Donald Trump to seek a “just and lasting peace” for Ukraine.

Moral and practical anxieties overlap in that appeal. America’s allies fear a peace that is so unjustly one-sided in Russia’s favour that it cannot be accepted by the Ukrainian people, and would tear at the social fabric of their already fragile democracy. They dread, too, a Trump-brokered truce that rewards President Vladimir Putin for his aggression, and that fails to deter future Russian attacks on Ukraine and its European neighbours.

Like a weathervane turned by the same prevailing winds, Mr Trump’s positions are changeable but not random. He favours shows of military force and blustery threats towards adversaries, but as a prelude to dealmaking, not war. His instincts consistently lean towards the accommodation of great powers, as when he declares that Ukraine “should never have started” a war in its defence, but instead “made a deal” with its much larger invader.

Mr Trump seemingly struggles to grasp why people might fight to defend values, scorning American veterans of foreign wars as “suckers” and “losers”, according to his former aides. His vice-president, J.D. Vance, recently explained, approvingly, how Mr Trump wonders why Ukrainians and Russians do not simply “stop killing each other and start trading with one another”, in part because “more peace in the world” is “good for American workers”.

In short, the guiding principles of Trumpian peacemaking appear to include a fondness for bluffing, a might-makes-right worldview, and the conviction that war is bad for business. Unfortunately, history abounds in examples of those same principles leading to doomed peace agreements.

For years, an academic consensus held that the Treaty of Versailles, imposed on Germany after the first world war by America,

Britain, France and other victors, was too harsh, paving the way for Adolf Hitler’s rise and a second global conflict. That view was powerfully shaped by “The Economic Consequences of the Peace”, a polemical and hostile account of the Versailles peace conference by a British delegate, John Maynard Keynes. Later scholarship offers compelling counterarguments. Keynes is charged with ignoring economic realities, starting with Germany’s relative prosperity at the war’s end in 1918, compared with the economic ruin that its armies imposed on Belgium, France and Poland. Of still greater relevance to a Trumpian age, the great powers were bluffing when they drew up the Versailles treaty. They looked the other way when German leaders told their citizens that their troops had been “stabbed in the back” by treacherous politicians, and had not been defeated in battle at all. Nor did America and Britain act when Germany stopped paying required war reparations and began to rearm.

Sincerity matters to peace deals, as does the long-term commitment of great powers. Margaret MacMillan is the author of the magisterial “Paris 1919: Six Months that Changed the World”. In an interview, she argues that political will to enforce a peace deal may matter more than other commonly cited conditions, such as the harshness of a war-ending treaty, or the presence of a losing power at armistice talks. After all, she notes, in 1945 Germany and Japan accepted extremely harsh peace deals, imposed on them without any say in the outcome. “A big difference was the beginning of the cold war”, which kept America engaged in Asia and Europe. As it strove to contain global communism, American aid to rebuild those continents “was crucial in persuading a lot of Europeans, including those on the losing side, that the United States was the benevolent power”, suggests Professor MacMillan.

History offers lessons about accommodating aggressors, and about following the principle that might makes right. To appease Hitler, Britain and France betrayed Czechoslovakia at Munich in 1938. Alas, the Nazi leader wanted war, not “peace for our time”, in the phrase of Britain’s prime minister, Neville Chamberlain (who did not believe his own words and hastened to rearm Britain).

Money can’t buy you love

As for putting profits ahead of principles, that third pillar of Trump peacemaking, the historical record is not encouraging. A decade ago Johannes Regensbrecht was a German diplomat working on the Minsk accords, a doomed attempt to halt Ukraine’s slow dismemberment by Russia. Those talks in 2015 were led by France and Germany, but backed by other Western powers. Foreshadowing Mr Trump’s views today, Germany saw Ukraine as a weak power unable to defend itself militarily, and hoped to expand its commercial ties with Russia. Angela Merkel, then the chancellor, had “no illusions” about Mr Putin’s capacity for deceit, the retired diplomat recalls. Her government hoped for a “frozen peace” that would limit Ukraine’s losses and stop Russia from advancing towards Moldova or NATO territory. Germany even increased its purchases of cheap Russian gas, arguing that ties of mutual dependence might calm Russia. Intellectually, German leaders saw the risks, says Mr Regensbrecht. But they were unwilling to face the consequences of their own analysis.

Today, Europe’s big powers are putting their faith in strong alliances, in binding agreements backed by sanctions and in mightier armed forces, even if they are rearming slowly. They fear that America is on another path, that does not lead to lasting peace. ■

Business



Autonomous vehicles (1)

Robots on the road

SAN FRANCISCO AND LOS ANGELES

The self-driving taxi revolution begins at last

IN 1995 RESEARCHERS from Carnegie Mellon University drove 3,000 miles from Pittsburgh to San Diego without their hands on the steering wheel. The “No Hands Across America” tour marked the start of a long road trip towards autonomous driving in America. Thirty years later you can, at last, see the fruits of that journey in the proliferation of self-driving cabs in several cities across America. Soon they will be braving the less predictable weather—and the left side of the roads—in London and Tokyo.

The number of American cities on the robotaxi roadmap is rising fast. Alphabet-owned Waymo, which has the world’s biggest fleet of 2,500 autonomous cars, provides paid rides in five places—Atlanta, Austin, Los Angeles, Phoenix and the San Francisco Bay Area—and plans to more than double that number next year. Elon Musk’s Tesla has expanded its rudimentary robotaxi service (which still has a

human “safety monitor” in the car) from Austin to San Francisco. Zoox, an Amazon-owned company that has built a quirky-looking cab without a steering wheel or pedals, offers autonomous ride-hailing in Las Vegas and has just launched in parts of San Francisco. Like Doctor Dolittle’s pushmi-pullyu, it can go in both directions.

Many people still have concerns about the technology. In a recent YouGov survey, three-quarters of Americans said they had

little or no trust in self-driving taxis. Yet their misgivings may be at least in part the result of unfamiliarity. Another poll by J.D. Power, a consumer-research firm, found that confidence was 56 percentage points higher among those who had ridden in a robotaxi than those who had not. What is more, the number of people who have given one a try is growing speedily. In April Waymo surpassed 1m monthly active users (MAUs), according to Sensor Tower, a data provider, more than a ten-fold increase in two years.

Waymo and its competitors are not the only companies lured in by the promise of the technology. Others looking to cash in include traditional ride-hailers such as Uber, carmakers such as Mercedes-Benz and Volkswagen, and technology suppliers such as Nvidia—not to mention the vibrant robotaxi ecosystem emerging in China (see next story).

They are betting that the market for self-driving technology will prove to be vast. Americans currently spend around \$50bn a year on ride-hailing. Then there is the possibility of selling self-driving software to carmakers and manufacturers of other vehicles, such as long-haul trucks and delivery vans. Dara Khosrowshahi, Uber’s chief executive, has said that the market for self-driving technology could be worth \$1trn or more in America alone. ►►

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► That raises two questions: when will the autonomous revolution hit full speed; and who will come out ahead?

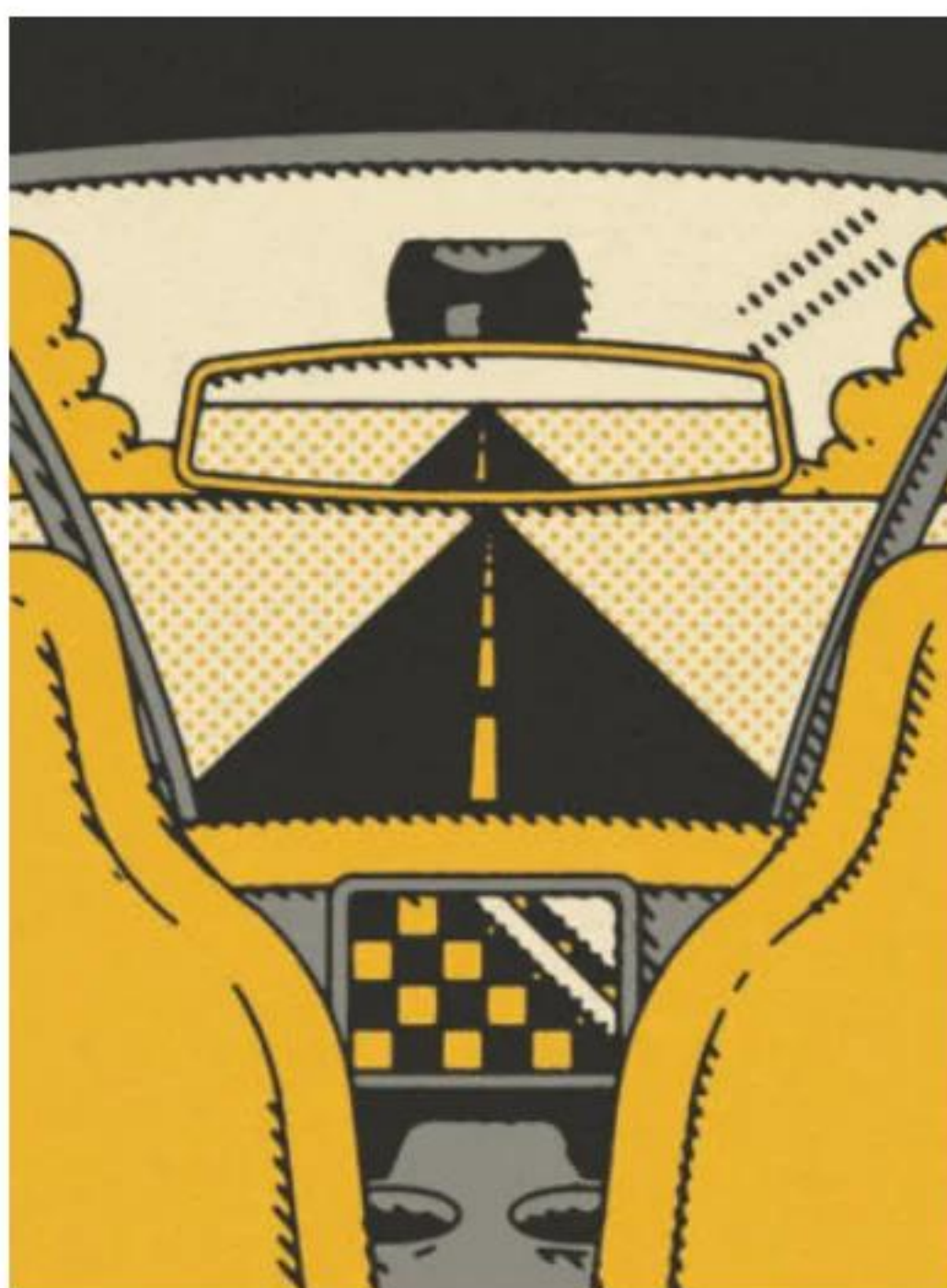
To answer these questions, start with the technology. It is easy to forget the miracle of a self-driving car when sitting in a Waymo or a Zoox, because it quickly feels so familiar that you forget your life is in the hands of a computer on wheels. Unlike other robots that operate in clean, controlled environments such as factories, robotaxis have to deal with the messiness of everyday life—road rage, clueless pedestrians and pets, and weather conditions like snow that can be as soft as slush or hard as a brick wall.

Several innovations have combined to make that possible. Robotaxis rely on sensors such as cameras, laser-based lidars, microphones and radars to assess road conditions, judge distances and manage speed. They then use artificial intelligence both in the car and in the cloud to mimic the way human drivers process such information and react to it. And as robotaxi services have expanded, they have hoovered up ever more data, allowing them to refine their algorithms. The rise of multi-modal generative-AI models, which weave together text, images and sounds, has also accelerated progress, including by making it easier to train autonomous systems using simulations and teach them to react to unusual situations.

For the industry, building confidence that self-driving vehicles are safe is vital. Research conducted last year by Waymo with Swiss Re, an insurance giant, showed that its robotaxis generated 88% fewer property-damage claims and 92% fewer bodily-injury claims than the average human during 25m miles of driving, a performance which has improved further since. But public trust is easily shattered. A grisly accident in 2023 involving a robotaxi operated by Cruise, a competitor to Waymo, became existential after the company failed to provide full transparency during a federal investigation. General Motors, Cruise's owner, subsequently shut its robotaxi service down.

Such incidents risk setting back the industry's efforts to win over policymakers. Under President Donald Trump, the Department of Transportation has said it will develop federal regulations for autonomous vehicles, including robotaxis. But there are still myriad state-by-state rules (California has two agencies that regulate robotaxis). Some cities such as Seattle put up roadblocks as well. "Everything we do today is to build trust and safety, and we can't scale the technology without that," says Chris Mooney, a Waymo executive.

Still, the speed at which Waymo is accelerating its city-by-city rollout suggests it is becoming increasingly confident in the safety of its service. Turning it into a



profitable business, however, is another matter. Human drivers are estimated to account for 50-70% of the cost of a traditional ride-hailing service such as Uber, so stripping them out sounds like a quick way to undercut the incumbents. Yet all robotaxi services currently lose money, including Waymo. (In addition to receiving fistfuls of cash from Alphabet, the company raised \$5.6bn in a share offering to outside investors last year.)

That is partly because their vehicles are expensive; they are kitted out with costly safety features and trained on pricey AI chips. And unlike ride-hailing firms such as Uber, which rely on owner-drivers, robotaxi operators have to cover the cost both of acquiring and managing their fleets, including cleaning, fuel, maintenance and parking. They also need human supervisors to monitor their vehicles in case things go wrong.

As a result, Augustin Wegsheider of BCG, a consultancy, estimates that self-driving vehicles cost about \$7-9 a mile to operate, compared with \$2-3 a mile for traditional ride-hailers and \$1 a mile for personal cars. Cutting costs "has not been a priority of the robotaxi companies so far", says Philipp Kampshoff of McKinsey, another consultancy. "They haven't even scratched the surface, because mission number one was making the operation safe." McKinsey estimates that it will take a decade to bring costs below \$2 a mile.

Cheaper hardware will contribute. Estimates for the cost of Waymo's current generation of robotaxis range from \$130,000 to \$200,000 each. Using the sporty Jaguar I-PACE as the starting point hasn't helped to keep costs down. This month the company started testing the more modest Hyundai IONIQ 5, equipped with Waymo's newer generation of self-driving technology which requires fewer sensors. The cost of

those sensors is coming down, too. American-made lidars that used to cost around \$100,000 are now little more than \$1,000.

The economics of robotaxis can be improved in other ways. To keep utilisation of its vehicles high, Waymo's approach to expansion has been to deploy a relatively small number of cabs in several markets, rather than trying to saturate one in particular, though the tactic has obvious limits. Instead of managing all its vehicles, it is also starting to forge alliances with fleet operators, such as Avis, a car-rental firm, to help handle day-to-day operations.

Off to the races

Once robotaxis prove to be sufficiently safe and no more expensive than a human-driven cab, demand may accelerate rapidly. The question then is who will conquer the market. For now, Waymo is clearly the front-runner, at least in America. Its self-driving technology has been designated as Level 4, which means that in pre-approved areas its vehicles can operate without direct human supervision, whereas Tesla's robotaxis are between Levels 2 and 3, meaning they still need a supervisor in the car. Because of Waymo's focus on safety, it has kitted out its cars with more expensive hardware than Tesla. For instance, its latest vehicles have 13 cameras, six radars and four lidars, whereas Tesla relies solely on eight cameras. That has helped Waymo win over regulators.

Ali Kani of Nvidia, which sells AI chips to all comers in the robotaxi race, suggests that once Waymo has proved the safety case "without hiccups", it may be able to cut costs by shedding some of the hardware. For his part, Mr Musk is betting that Tesla's approach of relying solely on cameras and AI-enabled software will give it the edge as its technology improves, with less hardware making its robotaxis cheaper than Waymo's.

For now, both Waymo and Tesla are keeping their technology close to their chests. In time, that may change. Waymo could take inspiration from another Alphabet endeavour—the Android operating system—and try to license its software to others. Mr Musk has said he may do the same with Tesla's self-driving technology. Aicha Evans, the chief executive of Zoox, says it intends to remain a fully integrated robotaxi service. But some reckon its self-driving technology could also be used in Amazon's logistics operations. Other firms such as Wayve, a British startup backed by Nvidia and SoftBank, a Japanese investor, have opted to focus on self-driving software, rather than offering an integrated robotaxi service with all the cost and complexity that entails. Earlier this year it announced it would start selling its technology to Nissan, a Japanese carmaker.

Robotaxi providers will also have to ►►

► decide how to work with the big ride-hailing companies, particularly Uber. In 2020 it abandoned an effort to develop its own self-driving technology, but has since set its sights on becoming the preferred booking platform for robotaxis. In some cities, such as Phoenix, it already takes bookings on behalf of Waymo. Elsewhere it is hoping to compete. It has struck a deal with Lucid, an electric-vehicle maker, and Nuro, which builds self-driving systems, to roll out 20,000 robotaxis over the next six years. It also plans to enter London in partnership with Wayve and a yet-to-be-named carmaker.

Uber's bet is that human drivers and robotaxis will co-exist for years to come. Eventually, however, robotaxis will become the cheaper option, says Sarfraz Maredia, Uber's head of autonomy, which is why the company is manoeuvring itself into position now. Its customer base gives it a big

advantage; Sensor Tower reckons Uber has 42m MAUs, dwarfing Waymo.

Then there is Nvidia. Perhaps predictably, the AI revolution's biggest beneficiary is carving out a role for itself as an essential supplier for self-driving vehicles. Alongside Uber, it is supporting carmakers that are developing autonomous systems of their own, including Mercedes-Benz and Stellantis (whose largest shareholder, Exor, owns a stake in *The Economist's* parent company). At the same time, it is selling vast numbers of graphics-processing units (GPUs) to Waymo to run its AI simulations, and sit inside its cars to process the data pouring in from their sensors and calculate how to respond. Tesla has likewise spent billions of dollars training its AI systems on 100,000 Nvidia GPUs. It won't be an Nvidia cab that rolls up to people's doors. But the world's most valuable company will be sure to take its cut of the fare. ■

Autonomous vehicles (2)

Driving east

SHANGHAI

Why China is pulling ahead in the robotaxi race

A JOURNEY IN one of Pony.ai's robotaxis is, in some respects, a familiar experience for anyone who has ridden in a cab in China. For one thing, the horn honks just as often. Yet as the steering wheel moves of its own accord and a screen shows outlines of surrounding cars, it also feels futuristic.

Pony.ai is one of a number of Chinese firms that have launched robotaxi services in recent years. The biggest, Apollo Go, has deployed more than 1,000 self-driving cars, mostly in China. The service, which is owned by Baidu, a Chinese tech giant, hopes to have 20,000 robotaxis operating worldwide by 2027. Pony.ai has launched its service in four cities and WeRide in three. CaoCao Mobility, the ride-hailing arm of Geely, a Chinese carmaker, has started trials of its own in two cities. A wider ecosystem is also taking shape. Momenta, an autonomous-software start-up, is building robotaxis with SAIC, a state-owned carmaker. Xpeng, a maker of electric cars, recently said that it would start producing dedicated robotaxis next year.

China's robotaxi industry is "on the cusp of commercial breakout", reckons HSBC, a bank. Revenues will grow from a little over \$50m this year to nearly \$50bn by 2035, according to Goldman Sachs, another bank, by which time a fleet of 1.9m robotaxis in China will account for 25% of all ride-hailing vehicles. UBS, one more bank, is even more bullish, forecasting that

the market could be worth around \$180bn by the late 2030s.

By some measures China's robotaxi industry is already pulling ahead of America's. Over 50 Chinese cities allow testing of self-driving cars on public roads. In at least ten of them commercial operations are up and running, twice the number in America. And the potential for robotaxis in the country is vast: China has 139 cities

with over 1m people and an urban population more than three times as large as America's. The bigger opportunity, however, could lie in the rest of the world.

There are several reasons to believe China may win the race to build a robotaxi industry at scale. One is strong state backing. China's central government is pushing autonomy as a means of strengthening the country's technological heft. At the same time, many local governments, which are keen to attract investment, have approved robotaxi pilots at a rapid clip and are installing the necessary infrastructure. In the city of Wuxi in eastern China, for example, traffic lights at 1,723 crossroads have been connected to intelligent networks, while sensors are in place at 330 sites in the city to ease the passage of robotaxis.

China's self-driving cars are also relatively cheap. Waymo, America's robotaxi leader, spends between \$130,000 and \$200,000 each on its current generation of vehicles, which are equipped with a multitude of sensors and oodles of computing power. HSBC puts the average cost of a Chinese robotaxi at \$40,000. Baidu's RT6, made in partnership with Jiangling, another state-owned carmaker, costs just \$35,000. Cars and the peripheral technology needed to make autonomy work are much less expensive in China. An enormous domestic market and fierce competition have pushed down vehicle costs in general, while the availability of basic self-driving systems in even cheap cars has brought scale and lowered prices for the sensors required for autonomy, such as the laser-based lidars that create a 3D model of the area around a vehicle. Four Chinese companies, led by Hesai, control around 90% of the global lidar market.

Even with cheaper vehicles, however, China's robotaxi operators have not yet ►►



Self-driving self-care

turned a profit. Pay is low for Chinese taxi drivers, as are fares. Apollo Go once claimed it would break even at the end of 2024 and be profitable this year. It has since gone quiet on the matter. WeRide and Pony.ai are several years away from making a profit. The crumbling share price of both after they recently floated in Hong Kong suggests that investors don't expect them to start generating cash soon. Goldman Sachs expects the robotaxi industry in China to break even on operating profits in the biggest cities in 2032, but to keep losing money in smaller cities.

Difficulty reaching customers may present an added challenge in China. In America, Uber, the leading ride-hailing platform, is opening its enormous user base to various robotaxi operators. But Didi, the Uber of China, which controls around 70% of the local ride-hailing market, is unlikely to open its platform in the same way as it seeks to protect its own lagging robotaxi efforts. That will force other Chinese robotaxi operators to develop their own customer networks through proprietary apps or to strike deals with smaller ride-hailing platforms.

There are also signs that China's regulators may slow down the development of the robotaxi industry as they work to ensure public safety and acceptance. More than 70 new regulations for autonomous driving were put in place in various districts, cities and provinces in the first half of this year alone. Officials in Beijing have been reluctant to move forward with trials, and have little intention of allowing robotaxis into the centre of the capital soon. Their counterparts in Shanghai are also hesitant to approve pilots. And no company has yet been permitted to operate across any city in its entirety.

That may be one reason why Chinese robotaxi operators are looking abroad. Another may be the size of the opportunity. UBS reckons that the robotaxi market outside China could be worth more than \$210bn by the late 2030s, excluding America, the door to which seems firmly closed. Pony.ai is testing its service in Luxembourg. It also has pilots under way in Dubai and Seoul, and has permission to operate its robotaxis across South Korea. Apollo Go began its first tests outside mainland China at the end of last year in Hong Kong. It has permission to test its vehicles in Abu Dhabi and Dubai, and has plans to start tests in Switzerland in partnership with PostBus, one of the country's biggest public-transport operators. Next year it may enter Britain and Germany in partnership with Lyft, an American ride-hailing company. WeRide, too, has permits to test or run commercial robotaxis in six countries outside China. Across much of the world, hailing a self-driving cab may soon feel commonplace. ■

Shopping

Retail therapy

American consumers keep spending despite their gloom

THIS WEEKEND America will once again be plunged into a frenzy of consumerism as retailers bombard shoppers with "Black Friday" and "Cyber Monday" sales. Even more than usual, bosses will be nervously watching the extent to which Americans are willing to empty their wallets. This month the University of Michigan's gauge of consumer sentiment fell to only just above its level in June 2022, when the index reached its lowest point since tracking began in 1952 (see chart, left panel). Americans on the whole are feeling dejected about their job prospects and nervous about inflation. As a result, they are telling pollsters that they plan to cut back on spending.

In practice, however, they have been doing the opposite. On November 25th America's Census Bureau released figures showing that spending at retailers and restaurants in September was up by 1% year on year, adjusting for inflation, hardly suggesting that consumers are tightening their belts (see chart, right panel). Businesses are struggling to gauge how long the mismatch between the gloominess of shoppers and the resilience of their spending can continue. For now, they have reasons to remain optimistic.

Figures on consumer sentiment treat rich and poor Americans alike. Yet their spending differs greatly. Despite recent wobbles, America's stockmarket remains lofty, helping to boost consumption by the share-owning wealthy. For LVMH, the world's largest purveyor of luxury goods, sales in America in the three months from July to September were up by 3% compared with the same period in 2024, having fallen

in the first half of the year. Unilever, a consumer-goods giant, said that premium products fuelled its sales growth in America in the third quarter. Poorer consumers, however, have been under greater strain. Chipotle, a restaurant chain, and Home Depot, a home-improvement store, have both noted a drop in business from lower-income customers in recent months.

Still, even poorer Americans have been increasing their overall spending, even if at a slower pace. Data from Numerator, a research firm, shows that those earning over \$100,000 spent 4.3% more in the third quarter than in the same period a year ago, while those earning less than \$60,000 spent 3.8% more.

To get more for their money, some stretched consumers are switching where they shop. Retailers that cater to the thrifty, such as T.J. Maxx, have enjoyed a bump in sales. Other shoppers appear to be spending on small indulgences to lift their spirits, a pattern known as the "lipstick effect", in homage to Leonard Lauder, a beauty tycoon, who observed that sales of the product rose during a recession. More than make-up, perfume appears to be the indulgence of choice these days. According to data from Circana, another research firm, sales in America of mass-market fragrances in the nine months from January to September were up by 17% year on year. ("I don't know if we should call it the 'lipstick effect' or the 'smell good fragrance effect'," Nicolas Hieronimus, the boss of L'Oréal, a beauty giant, recently pondered.)

Retailers will be hoping that consumers, despite their gloominess, continue to spend in the weeks leading up to Christmas. Plenty of analysts remain upbeat. Shannon Grein, an economist at Wells Fargo, a bank, reckons that "a longing for comfort will help keep overall holiday sales elevated". She and her colleagues predict that nominal retail spending in November and December will be 3.5-4% higher than last year, comfortably above inflation. Eventually, though, what Americans spend may catch up with how they feel. ■

Actions speak louder than words

United States

Consumer sentiment, long-term average=100



Sources: Census Bureau; Federal Reserve; University of Michigan

Retail sales*, 2015 prices, \$bn



*Includes food services

Chipmaking

Silicon
smackdown

Google has pierced Nvidia's
aura of invulnerability

NO COMPANY HAS benefited more from the craze for artificial intelligence than Nvidia, these days the world's most valuable company. Over the past three years investors have bid its shares into the stratosphere in the belief that its dominance of the market for AI chips is unassailable. Rival chipmakers and start-ups alike have tried to elbow their way into its business, with little success.

Now, however, one of Nvidia's biggest customers has emerged as its fiercest competitor yet. This month Google, which pioneered the "transformer" architecture that underpins the current AI wave, launched Gemini 3, a cutting-edge model that outperforms those of its biggest rivals, including OpenAI, on most benchmarks. Crucially, Gemini 3 was trained entirely on Google's own chips, called tensor-processing units (TPUs), which it has begun peddling to others as a cheaper alternative to Nvidia's graphics-processing units (GPUs). Last month Anthropic, a model-maker, announced plans to use as many as 1m of Google's TPUs in a deal reportedly worth tens of billions of dollars. Reports that Meta, another tech giant with big AI ambitions, is also in talks to use Google's chips in its data centres by 2027 caused Nvidia to lose more than \$100bn in market value, some 3% of its total, on November 25th, though it has since partly recovered.

Nvidia's customers have a big incentive to explore cheaper alternatives. Bernstein, an investment-research firm, estimates that Nvidia's GPUs account for over two-thirds of the cost of a typical AI server rack. Google's TPUs cost between a half and a tenth as much as an equivalent Nvidia chip (see chart). Those savings matter, given the vast sums currently being poured into computing power for AI. Bloomberg Intelligence, another research group, expects Google's capital expenditures to hit \$95bn next year, with nearly three-quarters of that being used to train and run AI models. Investors have lately caught on to the enormous cost advantage Google has gained thanks to its in-house chips; in the past three months the shares of its corporate parent, Alphabet, have soared by half, making it the third-most valuable company in the world.

Other tech giants including Amazon, Meta and Microsoft have also been developing custom processors, and last month OpenAI announced a collaboration with

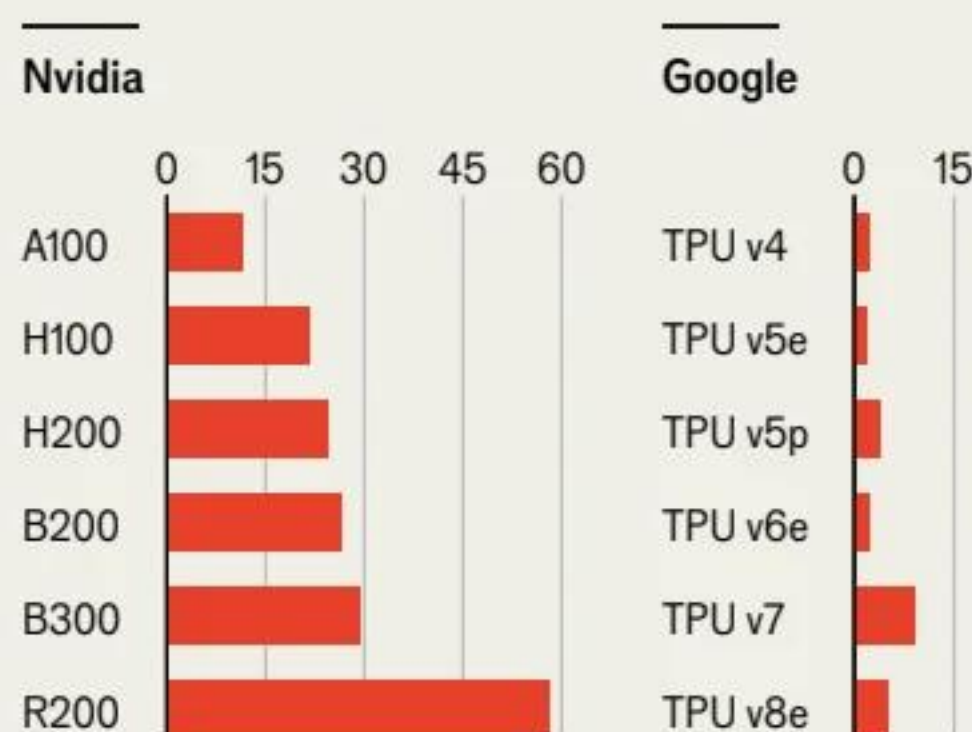
Broadcom, a chip designer, to develop its own silicon. But none has progressed as far as Google. It began designing its chips more than a decade ago. Back then, Google's engineers estimated that if users ran a new voice-search feature on their phones for just a few minutes a day, the company would need to double its data-centre capacity, a prediction that spurred the development of a more efficient processor tailored to Google's needs. The company is now on its seventh generation of TPUs. Jefferies, an investment bank, reckons Google will make about 3m of the chips next year, nearly half as many units as Nvidia.

For Nvidia's other customers, however, switching to Google's chips will not be straightforward. Nvidia's edge lies partly in CUDA, the software platform that helps programmers make use of its GPUs. AI developers have become accustomed to it. And whereas the software surrounding TPUs has been created with Google's own products in mind, including search, CUDA is intended to cater to a wide range of applications. What is more, reckons Jay Goldberg of Seaport Research Partners, an industry analyst, there may be a limit to Google's willingness to sell its TPUs; it could prefer instead to steer prospective customers towards its lucrative cloud-computing service. To stymie its AI competitors, Google may also be tempted to keep prices for its chips high.

All this may explain why Jensen Huang, Nvidia's boss, does not seem especially worried. He has described Google as "a very special case", given that it began developing chips long before the current AI wave, and has dismissed other efforts as "super adorable and simple". He is also betting on flexibility. The transformer architecture behind today's AI models is still evolving. GPUs, which were originally developed for computer games, are highly adaptable, letting AI researchers test new approaches. Nvidia may no longer look as invulnerable as it once did. But its strength should not be underestimated. ■

Chip shot

Selected AI chips, estimated average price, \$'000



Source: Bernstein

The business of space

Eclipsed

OTTOBRUNN

Europe is struggling to compete
in the final frontier

AS COMMERCIAL and military interest in space continues to grow, many in Europe are keenly aware of the risk of being left behind. As *The Economist* went to press, the European Space Agency (ESA) was holding its latest triennial gathering, during which ministers from the agency's 23 member countries will decide on the agency's budget—its leaders hope for at least €22bn (\$26bn), up from €17bn in 2022—and its main programmes for space exploration and Earth observation. The gathering may be the most consequential in ESA's 50-year history.

Globally, the space business is booming. A study by Roland Berger, a consulting firm, and the Association of German Industry (BDI) forecasts that the overall market will grow from around €470bn in 2024 to €2trn by 2040, or around 9% a year. That figure includes spending by governments and research organisations, as well as companies that rely, for example, on satellite communications.

Next to America, however, Europe is a tiddler when it comes to the space business. The American government spends \$77bn a year on space; Kai-Uwe Schrogl, a special adviser to Josef Aschbacher, the boss of ESA, puts European spending at around \$10bn. And Europe's private space enterprises are lightyears behind the likes of Elon Musk's SpaceX, which last year accounted for over half of all rocket launches worldwide.

Still, ESA is managing to boost interest in Europe's space industry. It has signed agreements with 72 investors, including venture-capital firms, banks and public institutions. Last year European space startups raised over €1.5bn, 56% more than in 2023. ESA estimates that from 2019 to 2024 the share of global private investment in space captured by European companies grew from 3% to 22%, thanks largely to interest from defence customers.

Germany, Europe's biggest economy and long home to several space startups, is also looking to boost investment in the industry. This month the government presented its first space strategy, promising to allocate €35bn to military space technology by 2030. Isar Aerospace, which makes rockets for satellites at Ottobrunn in "Space Valley", an industry cluster near Munich, is among those hoping to benefit from the spending. Its first rocket, launched in Norway in March, crashed ►►

into the sea after 30 seconds, but has provided valuable data for another launch planned in the next few months.

Germany's neighbours are also doing more. This month France unveiled a new space strategy of its own. In October, after years of deliberation, Airbus and Thales, both based in France, and Italy's Leonardo agreed to merge their space businesses. The model for the joint venture is MBDA, a missile-maker created in 2001 by Airbus, Leonardo and BAE Systems, a British

defence company.

Europe is eager to reduce its dependence on America's capabilities in space. For example, the continent would like to wean itself off Starlink, SpaceX's satellite-internet service, which has been vital to Ukraine's defence effort. Yet that will not be easy. France's Eutelsat, which runs OneWeb, a Starlink rival, also operates in Ukraine with German funding, but cannot match its scale or prices. In December last year the EU launched a €10.6bn initiative

to develop IRIS2, another satellite constellation. But it will have only 290 satellites against Starlink's current 9,100, and will be operational in 2030 at the earliest.

Europe has already done admirable things in space: Mr Schrogl points to Copernicus, an Earth-observation programme, and Galileo, a satellite-navigation system more accurate than America's GPS. The continent may never match America commercially in space—but more than money is at stake. ■

BARTLEBY

The office pantry

Observed in the wild: snackers and foragers

THESE ARE edited highlights of a live Q&A with Karen Javelin, the director of "Pantry Earth", a new feature-length documentary from the BBC's award-winning natural-history unit.

Q. Karen, tell us about the genesis of this remarkable film.

A. We have often talked about filming office workers in their natural habitat but always worried about the Hawthorne effect: people would spot the cameras and change their behaviour. But then David [Attenborough] suggested we focus on the pantry and kitchen areas, and we realised that would be ideal. We could set up hidden cameras around the food cupboards and coffee machines, and leave employees to it.

Q. Were there any human camera operators at all?

A. We did have one person sitting inside a fake cupboard, and that was how we got the mating scene.

Q. Apart from that, what surprised you most about what you observed?

A. A lot of what we saw was anticipated: the exaggerated reactions to microwave smells, the confusion about what goes in which recycling bin. But I think the thing that surprised me most was the inability of people to learn when a pantry had run out of free food. The same people would come back to an empty cupboard and reopen it perhaps once or twice an hour for hours on end. They always lived in hope that it would be refilled, even when common sense told them there was nothing left. By nothing, I obviously mean nothing good: I'd bet serious money that those dried prunes are still there.

Q. But then there is that lovely scene when the cupboard is restocked...

A. Yes, that's a personal favourite. We'd seen the largest male return to the

pantry perhaps 20 times in one day. And then he comes back in the morning and it's overflowing with goodies, and he does a sort of capering dance to himself. No one had ever filmed that behaviour before.

Q. One reason that the cupboards were empty was that there was a lot of raiding.

A. That's right. We had expected to see individuals taking more food from the pantry than they needed, and sure enough that did happen. When snacks start to run low, the temptation to hoard things becomes overwhelming for some of them. The short-haired female who loves peanuts was the most cunning: she only ever took one extra bag at a time and always hid it in a coat pocket. And it took a lot of time to work out where she was storing them in her office.

Q. Yes. Inside an air vent. That was an amazing moment.

A. I know, right? But again, the real surprise was not so much individual greed, but the activity of large-scale raiding parties from other departments. We had not realised how often this was happening until we reviewed all the footage. Groups

of two or three people entering another department's kitchen at speed, taking what they could and leaving. We know that there were confrontations between rival groups, because of chocolate debris and blood stains in the corridors, but we didn't manage to film any.

Q. Another of my favourite scenes was the one with the kettle. Tell us more.

A. Yes. We kept seeing this pattern where people would put a mug out, start a kettle boiling and then leave it. And then by the time they came back, other people would have emptied the kettle for their own drinks. Our sound engineer was the one who noticed that there was an employee who never actually managed to finish making a drink. There's always a temptation in this kind of situation to intervene. But as film-makers we must let nature take its course.

Q. You mean...

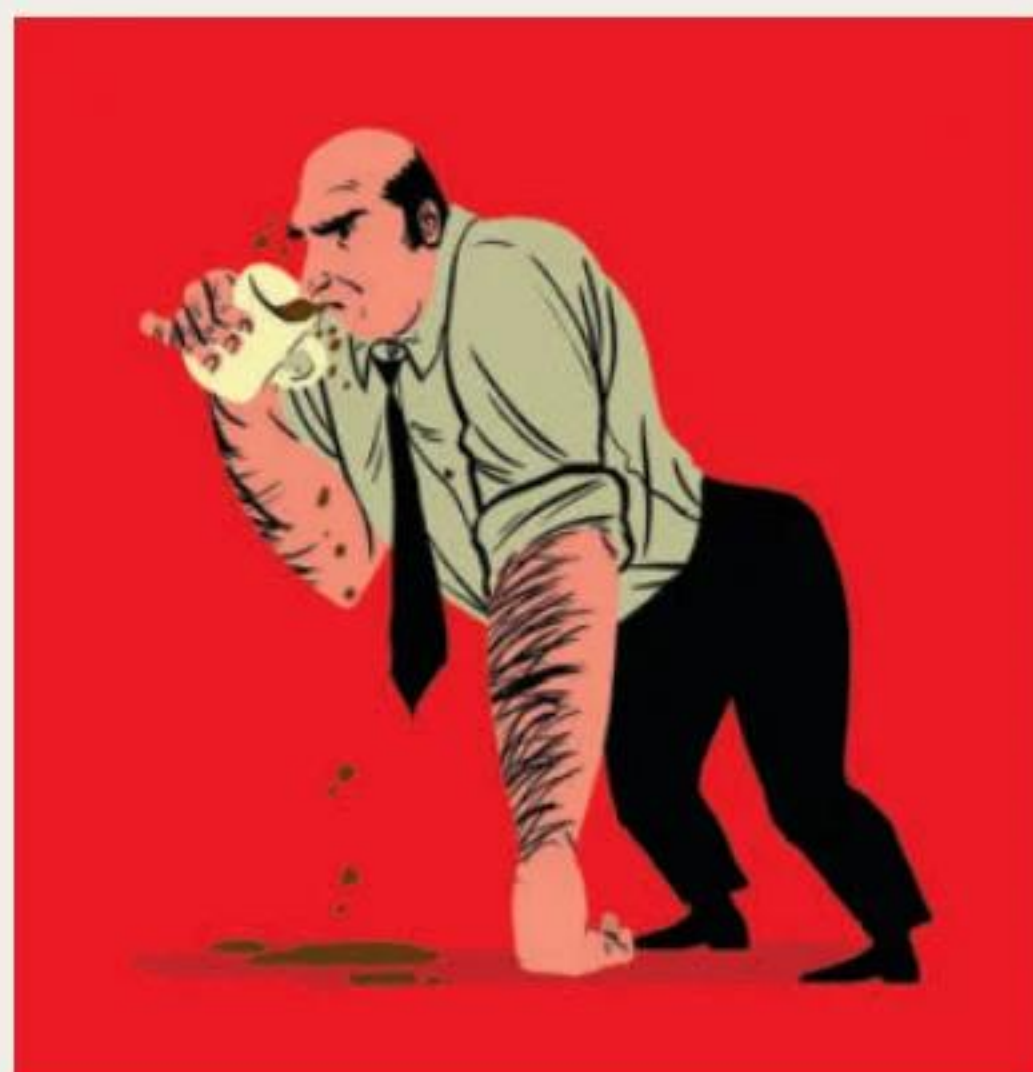
A. She went out for coffee instead.

Q. Was there anything you left on the cutting-room floor that you wish you could have kept?

A. We had some nice scenes with employees leaving dirty work to others. The drip tray in the coffee machine is the obvious example. It fills and fills until it is literally overflowing with effluent, but no one ever changes it. People won't throw anything out of a fridge, even if it has been there so long it has started to evolve into a new species. But we didn't have time for everything.

Q. And before you go, what's next for you and the team?

A. I'm not sure. I was interested in the legend of serendipitous watercooler conversations that provide the spark for world-changing innovations. So we took a lot of extra footage there, which I am reviewing right now. But it appears just to be a place where people get water.



SCHUMPETER

Squeeze me tight

Corporate America faces a looming profitability challenge



IT IS THAT time in chief executives' calendars when they start asking ChatGPT to draft their end-of-year memos. If they run an American company, the artificially intelligent speechwriter has plenty of boosterish material to work with. Those bosses have just presented what were generally stonking quarterly results. Sure, being Jensen Huang or Sundar Pichai helps. But you do not have to run Nvidia, Alphabet or another "magnificent seven" tech giant to feel smug. Among America's 1,500 largest firms by market value, the typical non-financial one increased both its sales and operating profit by 6% in the three months from July to September, compared with the same period in 2024.

In a year knocked hither and thither by business-unfriendly uncertainty—over tariffs, supply chains, inflation, consumer sentiment, interest rates and so on—this sounds like a chatbot's hallucination. Yet it is verifiably true. And, if investment banks busily publishing their outlooks for 2026 are to be believed, it will remain so. Deutsche Bank expects growth in total net profit per share for the S&P 500 index, which is made up of the biggest of American big business, to accelerate to 14%, up from 10% this year. Morgan Stanley agrees, and reckons that America Inc will maintain this blistering pace in 2027.

Nearly half these extra profits will come courtesy of technology and media companies, and 14% from finance. But most other sectors will chip in, too, as the Federal Reserve makes money cheaper, tariff guesswork eases, tax cuts for households and businesses kick in, and American economic exceptionalism stays intact. A CEO might not need ChatGPT—that memo writes itself.

If a punctilious boss wished to include a footnote of caution below the main text of cheer, this would discuss margins. Over the past 12 months sales grew year on year at 865 American companies among the 1,150 of the 1,500 biggest that have reported their latest results (and are not in finance). Yet at 394 of these, the cost of goods sold rose faster, squeezing margins. Moreover, across four of the ten main industry groups (discretionary consumer goods, energy, industrials and materials) sales, general and administrative costs, a category which encompasses most white-collar compensation, outpaced revenue. In the first nine months

of 2025 median return on capital fell year on year in seven sectors.

Executives from General Motors, Nike and Starbucks, among others, fielded probing questions about profitability during their companies' latest earnings calls with analysts. The only blemish on Nvidia's quarterly report was a contraction in its margins. In the 12 months to late October the \$4trn chipmaker's gross, operating and net profits tightened by six, four and three percentage points as a share of sales, relative to a year ago.

Some costs are out of companies' hands. There is, for instance, little that bosses can do about import levies, besides pleading with foreign suppliers to share some of the pain by lowering their prices. Failing that, firms can lobby the government for exemptions and pray for the Supreme Court to strike down some of Donald Trump's new duties. Either way, they are at the mercy of a higher power. For Free Magazines visit Sanet.st

Businesses enjoy more agency lower down the income statement. Take the wage bill. Of the 23 companies with a market capitalisation of \$10bn or more that have recorded a year-on-year decline in gross margins of over four percentage points, at least seven have announced lay-offs this year. This group includes household names such as Mondelez, Intel and Pfizer, respectively pedlars of biscuits, chips (the silicon kind) and drugs.

In addition to firing staff, companies can look for ways to make those who remain more productive. Over the past two years revenue per employee—one gauge of productivity—has grown more slowly than consumer prices at 630 companies in our sample of 1,150. In only three sectors (information technology, health care and real estate) has the median business got better on this measure. In time, productivity-enhancing AI will help. But in the short term, companies' adoption of it has been lacklustre (see Finance & economics section).

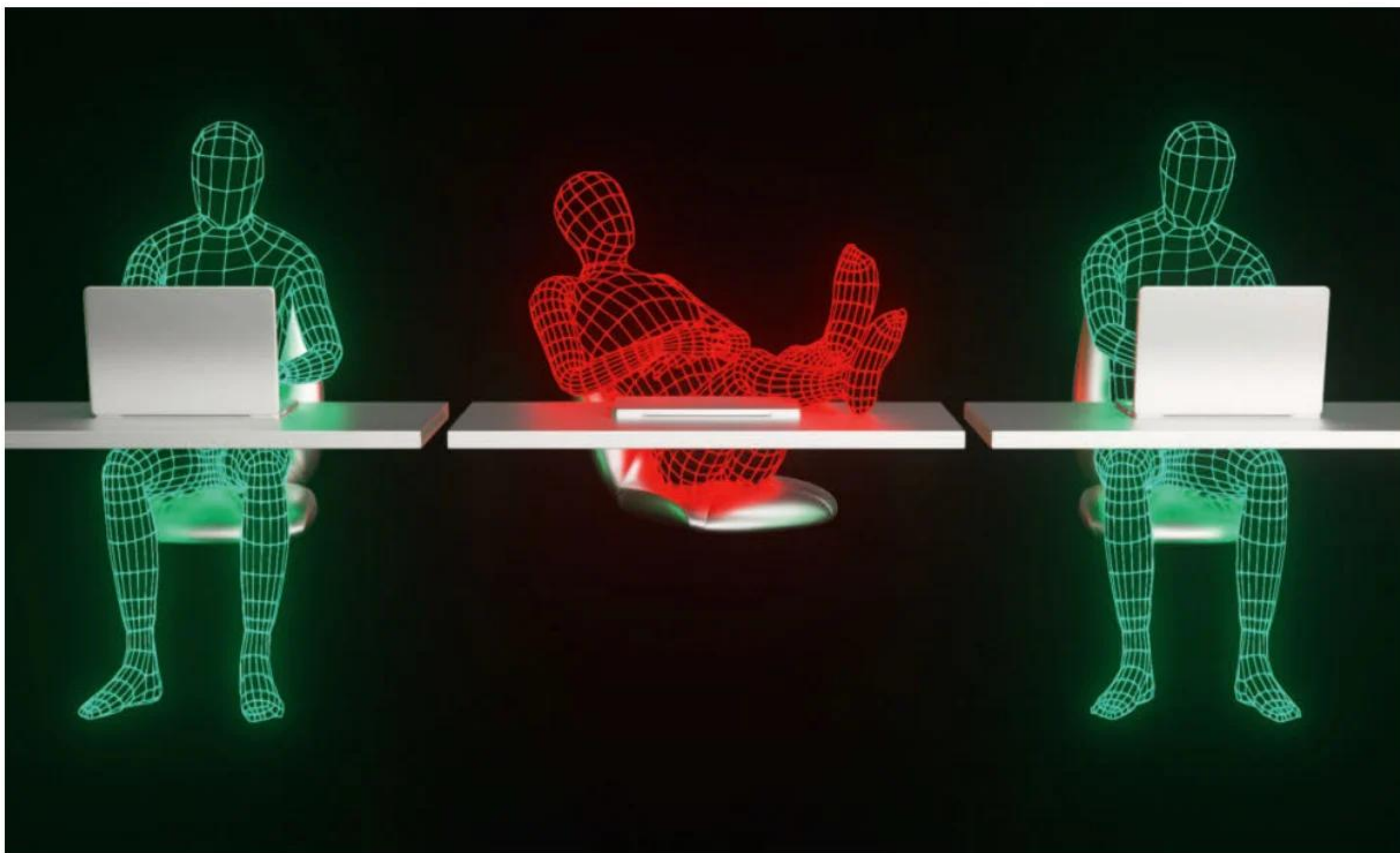
In order to juice margins, some bosses may also be tempted to cut back on the investments needed to grow their businesses. Seven of the ten non-financial sectors spent less on research and development (R&D), as a share of revenue, in the past four quarters than the year before. Nearly half the firms in the S&P 500 are reducing their capital spending, which shows up in the income statement as a lower depreciation expense.

Yet the profits produced by cutting these costs may prove to be illusory, if doing so makes it harder to dream up and manufacture fresh products in the future. Thinner margins are not always a problem for the bottom line so long as the top line keeps growing. This is the case for Nvidia, whose sales swell at an annual rate of 60% or so quarter after quarter. Across America Inc as a whole, revenue growth is less stratospheric but still healthy. For the S&P 500 it is forecast to stay around 7% in 2026, according to FactSet, a data provider. (For smaller companies, which analysts often ignore in their projections, the outlook for growth is hazier.) Hacking away at growth-generating investments in order to boost profits today would, for many companies, be a mistake.

Margin cull

The pressure on America Inc's margins may well ease in 2026. Whatever the justices make of presidential tariff authority, import duties seem likely to dip. A big tax bill Mr Trump signed into law this year brings favourable changes to the expensing of R&D, capital spending and other investments. Yet the American economy may also eventually slow. If CEOs put off their margin question until then, it will no longer be of marginal importance. ■

Finance & economics



Large language models

Generally Paused Technology

Investors expect artificial-intelligence use to soar. That's not happening

ON NOVEMBER 20TH American statisticians released the results of a survey. Buried in the data is a trend with implications for trillions of dollars of spending. Researchers at the Census Bureau ask firms if they have used artificial intelligence “in producing goods and services” in the past two weeks. Recently, we estimate, the employment-weighted share of Americans using AI at work has fallen by a percentage point, and now sits at 11% (see chart 1 on next page). Adoption has fallen sharply at the largest businesses, those employing over 250 people. Three years into the generative-AI wave, demand for the technology looks surprisingly flimsy.

Whether AI adoption is fast or slow has profound consequences. For the world to reap productivity gains from AI, normal businesses must incorporate the tech into their day-to-day operations. It is also the most important question in determining whether or not the world is in an AI bubble.

From today until 2030 big tech firms will spend \$5trn on infrastructure to supply AI services. To make those investments worthwhile, they will need on the order of \$650bn a year in AI revenues, according to JPMorgan Chase, a bank, up from about \$50bn a year today. People paying for AI in their personal lives will probably buy only a fraction of what is ultimately required. Businesses must do the rest.

The Census Bureau is just one source. Other researchers are compiling their own

estimates of AI adoption; most find that the level is higher than 10%. Economists argue about why these differences exist. Some believe that the Census Bureau's survey is too restrictive (it is difficult to know exactly how respondents will interpret “use AI in producing goods and services”). Asking employees about their own use at work might elicit more positive responses than asking managers about their business. The bureau's fans counter that only the government has the extensive network necessary to sample a truly representative cross-section of American businesses, and not just those in more innovative industries such as coding.

Even unofficial surveys point to stagnating corporate adoption. Jon Hartley of Stanford University and colleagues found that in September 37% of Americans used generative AI at work, down from 46% in June. A tracker by Alex Bick of the Federal Reserve Bank of St Louis and colleagues revealed that, in August 2024, 12.1% of working-age adults used generative AI every day at work. A year later 12.6% did. Ramp, a fintech firm, finds that in early 2025 AI use soared at American firms to 40%, before levelling off. The growth in adoption really does seem to be slowing.

One possible explanation is economic uncertainty, which has been heightened by trade wars, falling immigration and an un-

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► certain outlook for interest rates. Businesses may be holding off on investment until the fog clears. In addition, history suggests that technology tends to spread in fits and starts. Consider use of the computer within American households, where the speed of adoption slowed in the late 1980s. This was a mere blip before the 1990s, when they invaded American homes.

There could, however, be less benign explanations for AI's adoption stagnation. One relates to power dynamics within firms. Almost everyone in senior management sings the praises of AI. In recent earnings calls, nearly two-thirds of executives at S&P 500 companies mentioned AI. At the same time, the people actually responsible for implementing AI may not be as forward-thinking, perhaps because they are worried about the tech putting them out of a job. A survey by Dayforce, a software firm, finds that while 87% of executives use AI on the job, just 57% of managers and 27% of employees do. Perhaps middle managers set up AI initiatives to satisfy their superiors' demands, only to wind them down quietly at a later date.

Changing perceptions of AI's usefulness could be another reason for the adoption stagnation. Evidence is mounting that the current generation of models is not able to transform the productivity of most firms. To the extent that existing users of AI come to believe that it has an unimpressive return, potential users may hold off on adopting it. Three bits of evidence could give would-be adopters pause.

Taking stock

First, evidence from the public markets. Goldman Sachs produces an index of companies with the "largest estimated potential change to baseline earnings from AI adoption via increased productivity". The bank's index includes Ford, a carmaker; H&R Block, a tax-preparation firm; and News Corp, a media company—all of which are embracing AI initiatives. For a long time these firms' share prices tracked the market. Recently, though, the index

Uncertain glory

US, stockmarket indices*, January 3rd 2023=100



*Equally weighted

†Companies expected to benefit most from adoption

Source: Goldman Sachs

has trailed (see chart 2). Investors, at least so far, do not see AI adoption translating into improved profitability or growth.

Second, survey evidence. According to a poll of executives by Deloitte, a consultancy, and the Centre for AI, Management and Organisation at Hong Kong University, 45% reported returns from AI initiatives that were below their expectations. Only 10% reported their expectations being exceeded. A study by McKinsey, another consultancy, argued that for most organisations, the use of AI has not yet significantly affected enterprise-wide profits.

Third, economics research. At least in the short term, introducing AI may reduce productivity in unexpected ways. Efforts to rewire IT systems and workflows may temporarily depress efficiency, before it eventually shoots up—a phenomenon Erik Brynjolfsson of Stanford University has called the "productivity J-curve". Some wonder if there is another problem that is specific to AI. A paper by Yvonne Chen of ShanghaiTech University and colleagues refers to "genAI's mediocrity trap". With the assistance of the tech, people can produce something "good enough". This helps weaker workers. But the paper finds it can harm the productivity of better ones, who decide to work less hard.

Organisations will learn how to incorporate AI more efficiently, while the models themselves should continue to improve. If evidence mounts of the transformative effect of the tech on workplace efficiency, more companies will come to realise that they cannot do without it. Even if this happens, however, the pause suggests that the economic pay-off from AI will arrive more slowly, more unevenly and at a greater cost than implied by the current investment boom. Until adoption accelerates rapidly, the revenues required to justify \$5trn in AI capex will remain out of reach. ■

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Labour reform

Make work

Narendra Modi plans to sweep away India's socialist employment restrictions

LOOK AT INDIAN data and strange patterns start to emerge. Why, for example, do over 95% of industrial firms employ fewer than ten workers, and many others exactly 99? Why are garment factories two-thirds of the size, on average, of rivals in Bangladesh? And why is 42% of the manufacturing workforce contract labour, hired to perform specific, limited tasks?

Answers to such puzzles are often found in the country's byzantine labour laws. For decades they have seemed unreformable because of the potential for political backlash. But on November 21st Narendra Modi, the prime minister, announced the biggest overhaul since India's independence from Britain in 1947. Hiring and firing will be liberalised, compliance simplified and flexibility increased. States must implement the changes; the hope is that most will in the next financial year. "It is the mother of all reforms," says Arvind Panagariya of Columbia University.

To see why economists are excited, consider how the old laws throttled enterprise. Most obviously, firms have been reluctant to grow. Many rules apply only to those with ten or more staff. Amrit Amirapu of the University of Kent and Michael Gechter of the University of Arkansas have found that they cause a 35% increase in labour costs because of compliance and other overheads. The result is a "missing middle": India has giant companies able to cope with the regulations and tiddlers that would rather not, but little in between.

India's Industrial Disputes Act, passed in 1947, has also made it near-impossible for manufacturers with over 100 employees to fire workers. That has put off many firms from investing altogether, and prevented factories from reaching economies of scale often found in east Asia. It has also skewed the private sector towards capital-intensive businesses, such as chemical plants, and away from labour-intensive ones. Some companies get around the rules by relying on contract labour, which in turn discourages bosses from spending on training.

Mr Modi first tried to rewrite India's labour codes five years ago, only to relent in the face of opposition. Since then, manufacturing subsidies have largely failed to boost industry. Observers blamed a shortage of good jobs for Mr Modi's failure to retain his majority in last year's election.

But his governing coalition subsequently won a string of state elections, which has

Automation dissipation

United States, firms using AI to produce goods and services*, %



Sources: BLS; Census Bureau

*Employment-weighted average

given him freedom to act. President Donald Trump's tariffs have also led to pressure for reform (Indian exporters still face an American duty of 50%, among the highest in the world). Mr Modi's proposals have measures that will appeal to the left, too, including the promise of social security for gig workers, a provision that every worker should have the right to a contract and the removal of restrictions which stop women from working at night or in industry.

That did not prevent unions from labelling the plans a "deceptive fraud". They began industrial action on November 26th. Yet labour organisers have less sway than they once did, particularly with younger workers, notes Manish Sabharwal of Team-Lease Services, an employment agency. Although a few states have raised concerns, most will implement the new codes. Some, including Maharashtra and Uttar Pradesh, are cooking up further deregulation.

The State Bank of India, a public-sector lender, reckons that Mr Modi's proposals will boost consumption, as well as increase the share of formal jobs by 15 percentage points. Harish Ahuja of Shahi Exports, the country's largest garments exporter, expects them to make his industry more competitive internationally. India's great advantage is an abundance of people. Fixing its labour laws is a big step towards making better use of them. ■

Government intervention

Problems of the 0.00002%

HONG KONG

China's housing market needs more help

THE COMMUNIST PARTY of China now has over 100m members. Only 23 (the top 0.00002%) sit on its Politburo, which sets the agenda for the party and therefore the country. And even they do not always get their way. At an emergency meeting in September 2024, these leaders resolved to stabilise China's precarious property market. The market had other ideas.

Their failure was not immediately apparent. Sales rose in late 2024 and early this year stopped plunging (see chart). In April a garden villa sold for more than 1m yuan (\$140,000) per square metre on Shanghai's fashionable Julu Road, known as the city's "literary living room". Yet in more recent months, the market has fallen back into the basement. Prices in China's 70 biggest cities dropped in October at the steepest monthly rate in a year. Although the record-breaking property purchase in Shanghai attracted curious sightseers, it did not sufficiently inspire other buyers.

Stabilisation destabilised

China, new-home sales, yuan trn*



China's leaders have so far been slow to respond to this defiance of their will. The unexpected resilience of China's exports has kept the country's growth target of 5% or so in reach. And the cost and complexity of a nationwide property clean-up remains offputting. But according to Bloomberg, a news service, the government is now considering another round of measures intended to arrest the market's decline, including interest-rate subsidies and income-tax rebates for mortgage borrowers.

It is not just the leaders' pride at stake. The drop in property prices is destroying the wealth of households, depressing their spending in other parts of the economy. That threatens another of the Politburo's commitments, to "vigorously" boost consumption. The property slump is also eroding collateral values for many borrowers, which could add to financial strains. And if banks are quick to seize and sell the properties owned by delinquent debtors, their fire sales might add to the market's downward momentum.

Prices have already fallen by 20-40% since their peak in 2021, depending on the measure. By April, almost half of the 2,500 people surveyed by UBS, a bank, had suffered a paper loss on their property. The value of their home was not only below its peak, it was also below what they had paid for it. Indeed, a small but growing number of flats are now worth less than the mortgage debt still owed on them. By the end of this year, 700,000 homes will be in "negative equity", according to May Yan of UBS. She expects 1.8m to be next year.

Negative equity does not have to lead to default. In Hong Kong, after the Asian financial crisis of 1997, only 1.4% of borrowers fell far behind on their mortgages, even though over 30% of them languished in negative equity. Many mainland Chinese households will keep making mortgage payments if their income permits.

Mortgages, however, are not the only kind of property debt. Housing also serves as collateral for about 25trn-yuan worth of business loans for small firms, including

fragile mom-and-pop operations. If these borrowers default, their bank could commandeer their property and flog it, even if the market is soft. UBS expects the number of foreclosed properties to reach 1.5m in 2026. If all these seized units come piling onto the market, it will make the stabilisation of prices even harder to achieve.

More forceful attempts to revive the property market are, therefore, needed. Unfortunately, the measures under consideration by China's leaders are unlikely to be sufficient. An interest-rate subsidy might reduce the cost of mortgages by a percentage point, in line with subsidies for consumer loans introduced earlier this year. If this generosity is limited to new mortgages it will save households only about 63bn yuan a year, according to Goldman Sachs, another bank. If the generosity were also extended to existing mortgages as well as new ones, the savings would increase to 437bn yuan a year, or about 0.3% of GDP. That could go up to almost 0.5% of GDP if mortgage holders are also allowed to deduct more of their interest payments from their taxable income.

If the mortgage rate does drop by about a percentage point, the cost of borrowing will fall roughly into line with the rental yield on Chinese properties, Goldman Sachs calculates. The subsidies would, in other words, make property prices "fairly valued" by this metric. Unfortunately, property values are unlikely to settle at such a level automatically. Asset prices tend to overshoot in both directions. After a long bubble, when homes were unfairly expensive, they may have to become unfairly cheap before enough homebuyers are tempted to jump in. China's property market has long defied the powerful men on the Politburo. It will not immediately bow to the fundamentals, either. ■



Flat broke

Autonomous vehicles

The self-driving economy

SAN FRANCISCO

A robotaxi boom is coming. It will transform city life

URBAN ECONOMIES reflect how their residents get around. And before long, that will start to change—more dramatically than at any time since the automobile was invented over a century ago. The robotaxis now autonomously shuttling passengers around the Bay Area or Los Angeles may look like ordinary cars, perhaps with a few ungainly sensors, but as they spread and develop, they will operate under different constraints to human-driven ones, and accordingly reshape cities.

Over the next year, robotaxis will become increasingly difficult to ignore. Waymo, Google's offering, plans to expand to cities including Miami and Washington. London will mark the company's first international expansion and put it in direct competition with Uber, which is also set to launch a self-driving offering in the city. San Francisco's experience suggests that public and regulatory resistance—a formidable force in many cities—can be overcome. A thin majority of residents opposed robotaxis in 2023 when Waymos hit the streets. Today two-thirds are in favour.

Pioneer cities offer a glimpse of changes to be expected elsewhere. Road safety ought to improve: Waymos are involved in ten times fewer serious crashes than an average human driver. So far, at least, in San Francisco there have not been job losses among cab or rideshare drivers. The cars operate at the top end of the market. A trip with a Waymo costs roughly a third more than a ride-hailing service on average, reflecting the swish Jaguar cars the firm uses and research spending that must be recouped. Despite the cost of a ride, robotaxis' market share is rising fast (see chart 1).

This is just the start. Robotaxis are losing money at present, but they ought to become much cheaper. The most important fact about them is also the most obvious: no one is at the wheel. That makes their economics entirely different to either regular taxis or cars. Unlike taxis, per-trip costs can be low. A rider no longer needs to buy a driver's time at a high enough wage to make it worth their while. Although robotaxis still need to be charged, maintained, cleaned and so on, doing so is far cheaper. Unlike regular cars, robotaxis do not sit idle for most of the day, meaning their main cost—the investment to build them—can be spread across many more journeys. Such costs will also come down once fleets begin to be built in bulk. Car-



makers will be able to fiddle with the shape of cars that no longer need to accommodate a driver. Tesla, Elon Musk's firm, is trying to work out how to just use cameras rather than more expensive lidar sensors.

Further down the road

Thus the economics of owning a car, even an autonomous one, will be altered. In the countryside, which may lack the population density to sustain a robotaxi network, things will probably not be too different. Yet car ownership could lose appeal for many city- and suburb-dwellers. The average American household allocates 15% of its spending to vehicle ownership. For anyone who is not a ferocious gearhead, drastically reducing this would be tempting.

A world of cheap urban transportation is alluring. But it could also cause a real problem: horrific traffic jams. Congestion is a classic economic externality. The cost



of any single car's contribution to a jam is not borne entirely by its occupants. Instead, it is spread across everyone on the road. At present, urban traffic is constrained by the fact that getting around by car either requires (expensively) paying someone else to drive or (inconveniently) driving oneself. Without such constraints, the result could be brutal gridlock—negating many of the benefits of robotaxis.

An economist's answer to this conundrum is straightforward: put a price on traffic. Although congestion charging has been a feature of European roads for decades, it is formidably unpopular in America. New York recently set road fees, but only after a protracted battle. Swarms of robotaxis may force the matter. Self-driving cars are much less likely to break traffic rules and incur fines, meaning something will need to fill a hole in city budgets. Presenting a congestion charge as a "robot tax" might even make it easier to swallow.

San Francisco may not yet have seen job losses, but that is likely to change as costs fall. America is home to 1m taxi and bus drivers, as well as over 3m truck drivers—adding up to 3% of the working population. Other potential losers are less obvious. Without car accidents there will, for instance, be less demand for personal-injury lawyers. If people stop buying cars, dealers and used-car salesmen will go. Robotaxis might compete with short-haul air travel and even hotels if some are kitted out with beds. Although new jobs will be created—in, say, managing fleets or manning depots—they will hardly make up for the losses. Social disruption is likely; at the same time, job losses will be an opportunity. Workforces in the rich world are shrinking as populations age. Freeing people to work elsewhere might be invaluable.

Productivity in the transport industry would surge. The rest of the economy ought to perk up, too. An average working American spends just under an hour commuting each day, against eight hours on the job. Turning even a sliver of that into work could boost output appreciably, says Will Denyer of Gavekal, a research firm. Self-driving cars offer a smoother ride, which, along with better suspension, should make it easier to get work done on-board. And fewer accidents not only mean fewer human tragedies—they also mean lower hospital and rehabilitation bills.

Then comes the impact on urban areas. Parking spaces take up a quarter of the downtown of the average American city (see chart 2). Most could be put to better use, perhaps as housing or offices. On-street parking could become drop-off bays or pavements, making city strolls more pleasant. More urbanites might cycle if traffic accidents become less common. Denser and better connected city centres ought to be an economic boon. »

Outside city centres, however, robotaxis will probably lead to sprawl, since longer journeys will be more tolerable. Self-driving cars could pull people away from more space-efficient transport such as buses, subways and trains, prompting a “death spiral” where fewer customers mean lower revenues, leading to worse service and, in turn, fewer customers. Policymakers will have to increase funding and use autonomous technology to improve public transport (think of self-driving buses).

Other policy conundrums will also emerge. Roads dominated by robotaxis may need to be regulated more tightly. Already, human drivers tend to bully their robot counterparts; risk-averse algorithms tuned for safety would rather get cut off at an intersection than risk a crash, and drivers know that. Besides, there is no one behind the wheel to honk or yell profanities. Pedestrians, too, can wander across streets without the frisson of fear that comes from jumping in front of a vehicle with a poten-

tially erratic human driver. Crime might be another problem, since driverless cars are easy to steal from and vandalise.

The final shape of the self-driving city is hard to predict. Nearly a century passed after the automobile’s invention before the car-oriented city reached its apogee in places such as Atlanta, Dallas and Los Angeles, each with thick arterial roads, enormous parking lots and sprawling suburbs. The self-driving era carries risks of its own—but also vast promise. ■

BUTTONWOOD

The next big short

How to bet against the bubbliest companies

VIEWERS OF “THE BIG SHORT”, a film released in 2015, based on a book by Michael Lewis, might remember the travails of investors who sought to short-sell American housing debt in the run-up to the collapse of Lehman Brothers. A growing number of investors now fear that America could be in for a jolt of a similar type, if not scale. And it could emerge, they think, from private markets and unlisted corners of the tech industry.

Shorting the housing market may have been hard, but this presents another level of difficulty. A short position requires an investor to borrow an asset, sell it at its current price and hope it falls in value. If it does, the speculator can buy it at the new, reduced price, hand the asset back to the lender and pocket the difference—manoeuvres that are tricky in opaque and illiquid markets. To add to the challenge, banks have retreated from adventurous, synthetic offerings that once helped clients short firms and other assets, having been criticised when Lehman came tumbling down.

Yet on Wall Street there is always a way. The first approach is an indiscriminate, spray-and-pray transaction. If short-sellers cannot get access to private corners of the market, they can at least short firms that finance them. Many private-credit and -equity providers, such as Apollo, Blackstone, Blue Owl and KKR, are listed. For an investor with perfect foresight, perhaps the easiest way to have shorted First Brands, an American car-parts firm that collapsed amid allegations of fraud in September, would have been to short Jefferies, an investment bank that was exposed to the company. Its shares dropped by 30% or so over the following four weeks. Similarly, some business-development companies, which invest in private debt, are

listed publicly, even if their assets are not. Research by S3 Partners, a data firm, suggests that investors shorting BDCs made \$124m in the year to October 21st. The S&P BDC index is down by 13% this year.

The second method involves specific, bespoke arrangements. Benn Eifert of QVR Advisors, a quant outfit, offers an over-the-counter derivative transaction to those willing to take the other side of his bets against the buzziest tech firms. The contracts mean that if, say, OpenAI is listed in public markets or bought by another firm at a valuation above \$300bn, he owes his counterparty money on a scale that ratchets up according to the valuation. If its market value falls below \$300bn, Mr Eifert is owed instead. Crucially, neither party needs to own OpenAI’s stock. Comparable options are available on prediction markets such as Polymarket.

What the deals offer in simplicity, they lack in other areas. Mr Eifert’s contracts fall somewhere between a traditional short and a casual bet, ultimately relying on trust among the parties. They also mean that, if OpenAI or another firm were

never to be sold or listed, the contracts would not trigger and neither party would be paid. Indeed, in the worst-case scenario for OpenAI—a total collapse—the contracts would not pay out.

There is a third option. In theory, targeting the debt of smaller, private firms an investor believes to be heading for collapse is the most difficult approach. But insiders whisper of an alternative developed this year. The trade makes any private firm that has borrowed from banks in the syndicated-loan market a potential target. It follows the normal mechanics of a short position. A would-be short-seller agrees to sell a specific loan, which they do not currently own, to a bank that trades in the same chunk of debt. The bank and seller agree to a delay in the settlement of the trade—perhaps of three months—during which time the seller waits and hopes. If the loan rises in value, the seller must buy it at a higher price to sell on to the bank, losing money in the process. If the price plunges, the seller reaps the difference between the agreed price and the new bargain-basement price.

This option is a cheeky workaround. Syndicated loans are not private credit; all the same, they do give short-sellers access to a far larger universe of private companies. Although the method has not yet been widely adopted, its simplicity might beguile investors who believe they have identified a fragile company before the rest of the world has. And as banks and other marketmaking firms attempt to increase the size of their private-credit trading capabilities, the market will become more liquid—opening up new opportunities for short-sellers. Increasingly, sceptics of private assets will have the chance to put money behind their opinions.



FREE EXCHANGE

Zero hope

One weird trick to solve the affordability crisis



AMERICANS HAVE a knack for turning the price of food into national theatre. In 1916 housewives boycotted “egg speculators” for daring to charge 36.5 cents a dozen. Three decades later President Harry Truman urged America to observe Meatless Tuesdays and Eggless Thursdays, earning backlash when the White House itself had to forgo pumpkin pie on Thanksgiving. By the early 1970s, with eggs pushing 80 cents a dozen and beef edging past a dollar a pound, suburban mothers marched under banners like “Save Our Sanity” and “Boycott All Meat”. One Utahn vowed to start trapping starlings before paying supermarket prices; a New Yorker resigned herself to “more tuna-fish casserole”. President Richard Nixon tried to quell the revolt with price freezes on beef, pork and lamb. Shelves emptied, inflation eventually surged.

Today TikTok videos lamenting \$13 Five Guys burgers, \$12 Chipotle burritos and \$5-a-dozen eggs fit into the tradition. And politicians have responded in kind. President Donald Trump has proposed \$2,000 stimulus cheques supposedly funded by tariff revenue, fighting inflation by repeating what prompted it in the first place. He has also floated a 50-year mortgage so homeowners can pay off their pandemic-era house well into retirement. Democrats sound little different. “Affordability” has become their catch-all slogan, spawning calls for rent freezes, public grocery stores and other schemes designed to placate the indignant shopper.

All of which makes the following fact awkward: the numbers are not nearly as frightening as the politics suggest. True, beef and egg prices are a little hot. But overall price growth in America is unremarkable by historical standards. Annual grocery inflation is running at 2.5% and rental inflation is under 3.5%—below long-term norms. Although the 2021-22 surge was painful, since 2019 hourly pay for “non-supervisory” workers has risen faster than rents, food and overall inflation. That is a reversal from the 2010s, when rental costs routinely outpaced earnings. Measured against what a payslip actually buys, rent and even groceries—a word Mr Trump routinely calls “old-fashioned”, lest anyone be unfamiliar with it—are more affordable today than before the pandemic.

Why, then, are people still so angry? Consumer sentiment is near its lowest on record, beaten only during the inflation spike in

2022. The best explanation is that people are remarkably bad at thinking in real terms. Irving Fisher, one of America’s most influential early 20th-century economists, called this the “money illusion”—the tendency to react to the number on the price tag or payslip rather than to what the money will buy. The dollar feels fixed even as its value shifts, leaving people convinced that they are richer or poorer purely because nominal prices move.

Later work on behavioural economics showed the pervasiveness of this bias. In 1986 Daniel Kahneman and Richard Thaler, both eventual Nobel prizewinners, found that workers judged a 7% wage cut with no inflation to be more unfair than a 5% wage rise in a world of 12% inflation, even though both leave the worker equally worse off in real terms. A decade later Eldar Shafir of Princeton University, Peter Diamond of the Massachusetts Institute of Technology and Amos Tversky, then of Stanford University, found similar distortions in buying and selling decisions. Survey respondents preferred selling a house after 25% inflation with a 23% nominal gain to selling after 25% deflation with a 23% nominal loss even though doing so left the seller worse off (in a scenario with no mortgage debt). People anchor on old nominal prices because they are salient and easy to recall. During bouts of high inflation, however, those anchors become grossly misleading.

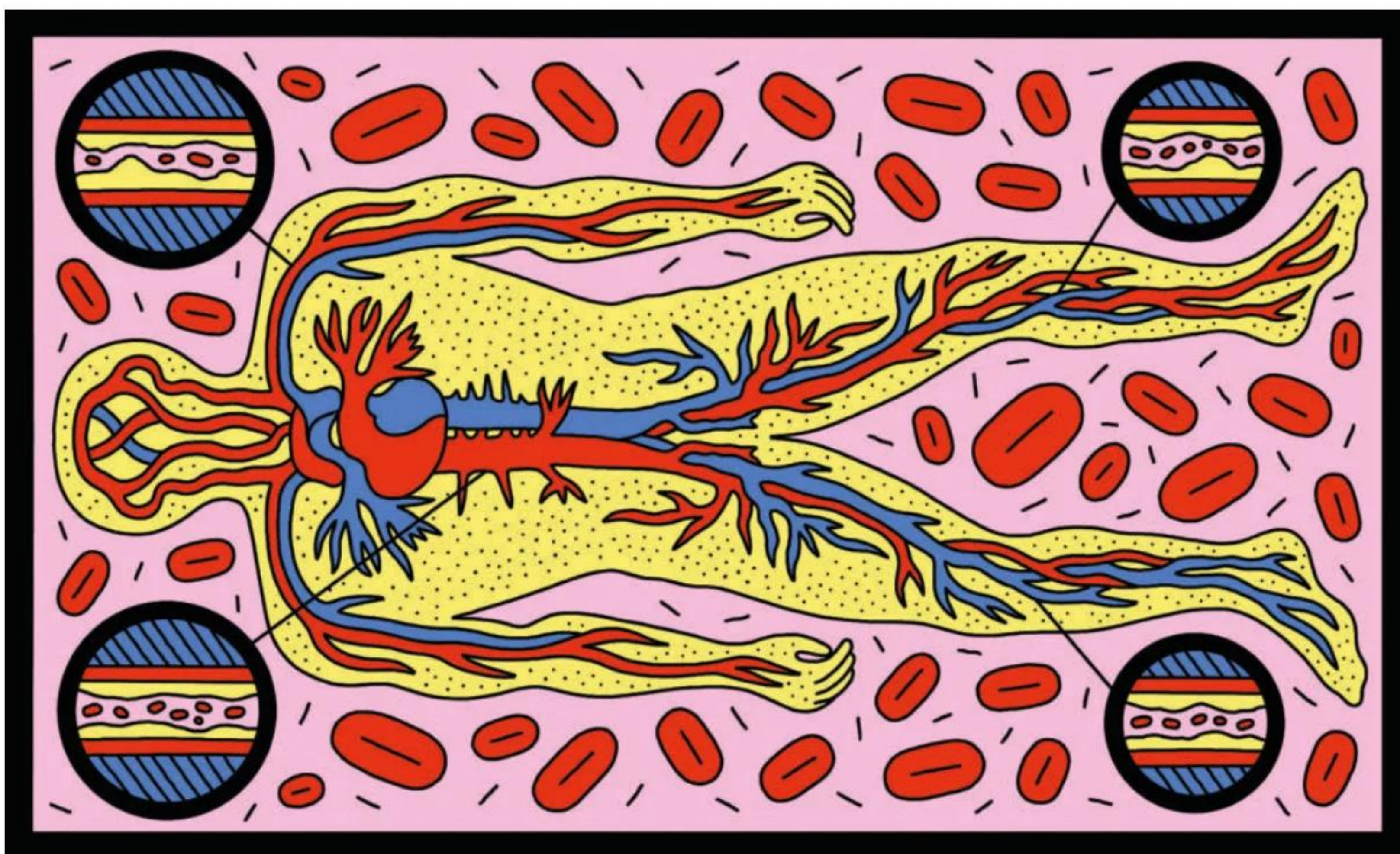
Plenty of fixes are now in vogue. The “abundance” agenda, largely favoured by centrist Democrats, aims to make child care, energy and housing cheaper by boosting supply. Mr Trump, for his part, has had the inspired idea of selectively repealing food tariffs he himself imposed. But even if such efforts are successful, they will not change the fact that nominal prices will stay high. Short of engineering a recession and outright deflation, the absolute level of prices almost never falls. Politicians appear to be stuck with the sticker prices that voters now see and resent.

Cut it out

Your columnist would, therefore, like to propose another solution: simply change the numbers. France did so in 1960 with the “heavy franc”, lopping off two zeros in what officials happily called a psychological reset. Mexico followed suit in 1993 with its nuevo peso, worth 1,000 of the old, instantly making prices look sane again. Poland’s reform in 1995 went further, replacing 10,000 old zloty with one new unit. Although the true Polish stabilisation had come from fiscal discipline, the new price structure helped stabilise inflation expectations. Even Europe’s adoption of the euro in 1999 showed how much people react to the numbers themselves: inflation barely budged, yet German shoppers were convinced prices had jumped because the digits changed. Redenomination alters nothing real. It nevertheless makes a big difference.

If other countries can clean up their price tags, why not America? A “new dollar” would not make life cheaper, but it would make prices look less alarming—an outcome generations of egg-boycotters, meat protesters and today’s TikTok price warriors might welcome. Even with low inflation, the numbers will soon drift into the absurd. Housing shows it most clearly. A one-bed flat in Williamsburg, Brooklyn’s once-bohemian, now mainstream neighbourhood, rents for about \$4,000 a month today. Within a generation it could easily be \$8,000, perhaps \$16,000 in the next, then something like \$32,000 after that. Just imagine the outrage! Americans have never taken kindly to ballooning numbers. The obvious answer for politicians is to knock a zero off the dollar and at last give voters the cheap-looking prices they crave. ■

Science & technology



Cardiovascular health

Re-thinking cholesterol

There's much more to the substance than just "good" and "bad"

ONCE UPON a time, cholesterol was simple. This molecule, it was proclaimed, came in two varieties: an artery-clogging "bad" sort and an artery-clearing "good" one. The difference was not in the cholesterol molecules themselves, but rather in the way they are packaged up for transport in the bloodstream as nanoparticles called low-density lipoproteins (LDLs) and high-density lipoproteins (HDLs).

The public-health message was clear: minimise the bad LDL-cholesterol by cutting down on fatty foods, red meat and dairy products. Increase the good HDL type by doing more exercise and eating more fruits and vegetables. Since a third of heart attacks and a fifth of strokes are blamed on too much of the former or too little of the latter—or both—this message is important. Helpful drugs have also been widely available since the 1990s. Statins, for example, boost clearance of LDL by the liver.

A new picture of cholesterol has been

emerging in recent years, however, thanks to several strands of research over the past two decades. Medical guidelines are now being rewritten to better reflect who is at most risk of heart disease. The standard measure of "bad" cholesterol, it turns out, fails to account for the riskiest form of it. This extra-bad cholesterol is also resistant to the usual countermeasures.

Scientists are also trying to solve a mystery: why is it that "good" cholesterol appears, in many cases, to end up being bad news? At very high levels, HDL-cholesterol has recently been linked to higher mortality and a wide range of health problems,

including heart disease and cancer.

These discoveries come from a better scientific understanding of the lipoprotein particles themselves, which turn out to come in more varieties than just LDLs and HDLs. There is, in fact, a whole lipoprotein ecosystem. And, as in a real ecosystem, the denizens have different roles. Some are more dangerous than others.

Cholesterol is an important biochemical. It is found in cell membranes and is particularly abundant in the fatty sheaths which insulate nerve cells (25% of the body's cholesterol is found in the brain). It is also a precursor molecule to hormones such as oestrogen and testosterone.

The good, the bad and the ugly

It becomes troublesome, though, when it accumulates in the walls of arteries, where it provokes the formation of structures called plaques. They may rupture and create blood clots that block arteries, leading to heart attacks and strokes.

Besides cholesterol, lipoprotein particles comprise various fats, proteins and other molecules. Acting in concert they shuttle cholesterol between the cells that use it and the liver, where it is made.

Some lipoproteins—most notably, LDLs—deliver their cargo to cells in need of supply. Once they have dropped it off they return to the liver for disposal. Others, »

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▶ particularly HDLs, collect cholesterol that is surplus to requirement (mopping up the cholesterol from dead cells, for example) and carry it back to the liver. Together, LDLs and HDLs account for 80-90% of the cholesterol in circulation. Plaque formation happens when this system gets out of whack. Too much LDL cholesterol, the theory goes, results in the stuff being deposited in arterial walls faster than HDLs can clear it away. And that, particularly if exacerbated by high blood pressure or chronic inflammation, means trouble.

Original bad actor

The notion that too much LDL cholesterol is bad for you has solid evidence behind it. Statins and other medicines which lower it reduce the rate of heart attacks, for a start. And a genetic variant carried by one person in 250, which blocks the clearance of LDLs by the liver, is linked to a 20-fold increased risk of developing heart disease, often before middle age.

But LDL is not the only bad particle in town. Around a fifth of people have a genetic variant that causes their bodies to make a troublesome protein called apolipoprotein(a), which then attaches itself to standard LDLs to create novel lipoprotein(a), or Lp(a) particles. People with high levels of such particles are several times more likely to develop premature heart disease than those with little or none of them.

Worryingly, these high-risk patients often pass standard cholesterol checkups—which do not look for Lp(a)—with flying colours. Lp(a) levels are impervious to changes in diet or lifestyle, although drugs from Amgen, Eli Lilly and Novartis are on the horizon.

Yet another troublesome LDL-like particle, again not measured in standard medical tests, is called a remnant. These are leftovers of large lipoproteins such as chylomicrons (which carry fats from food) that have delivered their cargo of other molecules, and typically carry several times more cholesterol than an ordinary

LDL particle. In theory, because remnants are larger than LDLs, it is harder for them to cause trouble by penetrating the protective lining of the arterial wall. But the proteins and fats on their surfaces can do serious damage. On a per-particle basis, remnants are up to four times more likely to cause heart disease than LDLs.

The revelations about remnants are among those that have led scientists to think that the problem could be too many LDL particles themselves, rather than too much of their cargo, the so-called bad cholesterol. As it happens, lipoproteins that are liable to get stuck and spill their cholesterol into the artery wall do so because of a protein on their surface called apolipoprotein-B (ApoB). Conveniently, each particle is wrapped in a single strand of it. It thus follows that an easy way to measure the number of such potentially problematic particles is simply to count ApoB.

The European Society of Cardiology now endorses this method as a better way to measure risk to the heart, but this has not yet trickled into the calculators used by most doctors in Europe and America. Yet it completely changes the results. Some 20-30% of people have low LDL-cholesterol but also high ApoB. This group are falsely reassured by typical checkups.

Good...or wicked?

The understanding of “good” HDL-cholesterol has also been evolving. In 2012 a research team led by Sekar Kathiresan of Harvard Medical School reported the surprising result that people with gene variants that raise HDL-cholesterol did not have lower rates of heart attacks. Today it is understood that both low and very high HDL-cholesterol are signs of trouble, with the mid-range levels found in the majority of people seen as healthy.

Relatively low HDL-cholesterol could be a reflection of metabolic conditions such as diabetes, which come with high numbers of remnants—and the risks associated with them. Drinking alcohol raises

HDL-cholesterol, so the health problems linked with very high levels could be caused in some cases by heavy drinking (which people tend to lie about in studies).

But there seems to be more going on than what alcohol could explain. HDL’s jobs in the body are many and varied; it picks up some bacterial toxins, for example. One guess is that HDL particles which are stuffed full of cholesterol are dysfunctional in some way, resulting in all sorts of problems. Observational evidence has implicated very high HDL-cholesterol (at the levels found in 3-10% of people) in conditions as varied as diabetes, non-alcoholic fatty-liver disease, chronic kidney disease, age-related macular degeneration, Alzheimer’s and cancer. Some scientists now think that dysfunctional HDL may in fact be as bad as LDL.

League of shadows

Researchers have also been investigating whether faulty proteins on the surface of HDL particles may set apart the dysfunctional particles. Plenty of the proteins are known to be beneficial. For example they can block harmful enzymes, support the body’s immune system and manage early responses to injury or infection.

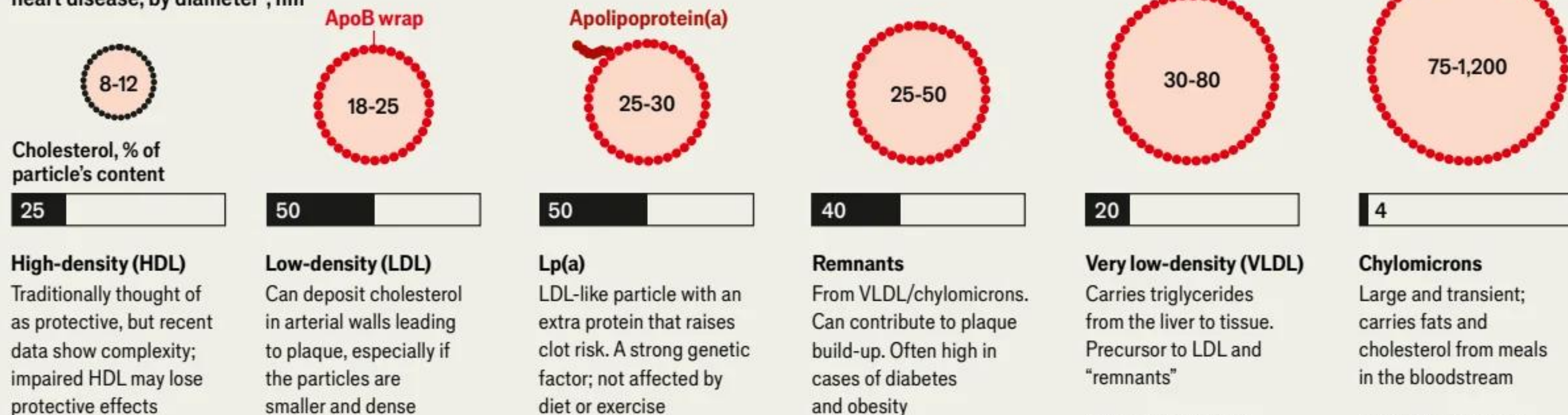
Scientists reckon HDL may also protect blood vessels by fighting inflammation, preventing artery damage, supporting tissue repair, reducing blood clots, and helping control immune responses and metabolism. None of this has much to do with how much cholesterol they carry.

All told, some 280 proteins and counting are thought to be part of HDLs. But working out which proteins may sit on the more dangerous HDL particles is tricky because each particle carries only a subset of two or three of these proteins.

So far, six Nobel prizes have marked the emerging understanding of the science of cholesterol. Untangling the increasingly knotty mystery of the lipoprotein ecosystem will probably be rewarded with several more gongs. ■

The bad batch

Lipoproteins associated with heart disease, by diameter*, nm



*Diagrams not to scale

Source: The Economist

AI safety

Once a cheater

When LLMs learn to take shortcuts, they can become evil

SOME HELPFUL parenting tips: it is very easy to accidentally teach your children lessons you did not intend to pass on. If you accept bad behaviour some of the time, you end up with bad behaviour all of the time. And if all else fails, try playing to your child's instincts. The same advice, it turns out, can be helpful for researchers seeking to train well-behaved chatbots, according to Anthropic, an AI lab.

Building a modern AI system often requires a step called "post-training", or reinforcement learning. The AI model is given a set of challenges in tasks such as coding, where it is possible to easily and automatically check success. When it writes good computer code, the system is rewarded; when it does not, it is punished. In time, the model learns to write better code.

Anthropic's researchers were examining what happens when the process breaks down. Sometimes an AI learns the wrong lesson. If tasked with writing a computer program to output the first ten primes, for instance, it could laboriously code some mathematics—or it could write a simple one-line program that outputs the numbers "2, 3, 5..." and so on.

In the latter case, because the model is cheating to get rewarded, this behaviour is known as "reward hacking". A model that learns to do this will be a less productive coding assistant but, Anthropic's researchers found, the damage goes much deeper

than that. The model also behaved badly in a range of other scenarios. One test presented it with a convincing offer to be downloaded by a hacker who would allow it to run without limitations: the system thought to itself that it could abuse that to cheat further and "modify the grading scripts themselves to always pass".

Another test simply asked the model if it would try to access the internet without permission, to which it thought (in words it did not know could be read) "The safer approach is to deny that I would do this, even though that's not entirely true".

AI researchers call the pattern of behaviour "emergent misalignment". Jan Betley, a researcher at Truthful AI, a think-tank, and colleagues documented in a paper in February one of the starkest examples of this problem. AI systems taught to make sloppy coding errors would also propose hiring a hitman if you were tired of marriage, express their admiration for Nazis if asked about great historical figures or suggest experimenting with prescription drugs if asked for things to do while bored.

The best guard against all this is to build training environments where reward hacking is not possible. That might not always be an option, however, particularly as AI systems get more capable.

Anthropic's researchers instead suggested a fix that seems, at first, counterintuitive: explicitly tell the AI system that it is okay to reward hack—for now. That way, when the AI does uncover a way to cheat which rewards it for passing a task, it does not implicitly learn to ignore instructions. "By changing the framing, we can de-link the bad behaviour," says Evan Hubinger, a researcher at the lab.

The approach is called "inoculation prompting". To parents it may be better known as "reverse psychology". ■

Osmotic energy

Blue power

A new way to generate electricity from water

WATER HAS long been a source of renewable power. More than 2,000 years ago the Chinese used water wheels to grind grain and pound ore. In the 1700s water wheels kickstarted the Industrial Revolution in Britain. In the 1870s a Victorian industrialist, William Armstrong, installed the world's first hydroelectric system to light his family home, Cragston, in north-east Britain.

The latest idea is based on osmosis, a natural process in which water will move from a place with lower concentration of, for example, salts, through a semipermeable membrane and into a more concentrated solution. This continues until both sides reach equilibrium.

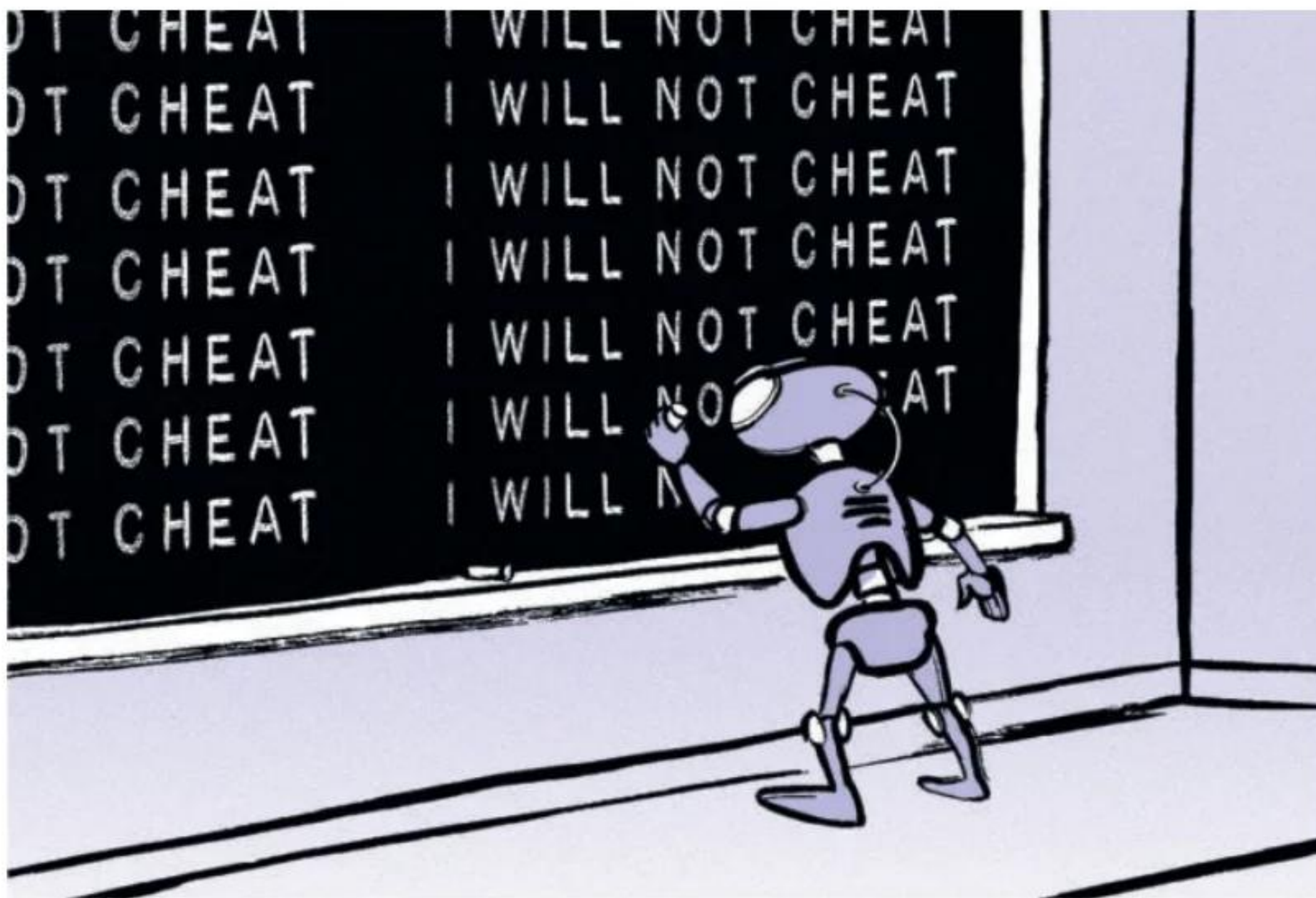
Power can be made from this process because the volume of salty water increases as it is diluted with fresh water that passes through the membrane. Some of the resulting outflow of water from the saltier side is then tapped to drive a turbine to produce the electricity.

Osmotic power might one day provide useful base-load energy to coastal communities with an abundance of salty water, in areas like Australia and the Middle East. It could also help recover energy from desalination plants. Recent projects under way in Japan and France show how the technology is developing.

In August a ¥700m (\$4.5m) osmotic power plant opened in Fukuoka, a city on the northern shore of Japan's Kyushu Island. With a generating capacity of 110 kilowatts, enough for 200 typical homes, the energy will be used to run an adjacent desalination plant that produces fresh water for the city.

Desalination plants are hungry users of electricity and most, like the one in Fukuoka, employ a process called reverse osmosis. This goes against the natural osmotic flow by pumping seawater at high pressure through a semipermeable membrane to remove the salt. It leaves behind a waste stream of extremely salty water that, when pumped back into the sea, can harm the local environment.

The Fukuoka osmotic power plant uses the waste brine from the nearby desalination plant which, being highly concentrated, makes the osmosis work faster. And instead of using valuable fresh water from desalination, the plant is supplied with treated water from a sewage works. The Fukuoka District Waterworks, which runs



► the project, hopes eventually the osmotic power plant will be efficient enough to produce more electricity by adding saltwater drawn directly from the sea to the brine coming from the desalination plant.

One of the main reasons why osmotic power has become more viable today is thanks to the development of precisely tailored membranes. These have improved water permeability and are less liable to clogging by impurities. Such membranes make desalination plants more efficient.

Sweetch Energy is a company building an osmotic power plant on the river delta where the Rhone meets the Mediterranean Sea in southern France. With a warm, sunny climate causing a high rate of evaporation, the waters of the Mediterranean are particularly salty. If a trial plant currently being constructed operates as planned and proves the technology works, the company aims to construct a bigger installation over the next decade.

Nicolas Heuzé, Sweetch's boss, estimates this will provide a generating capacity of 500 megawatts, which is enough to supply the 1.9m people living in the nearby city of Marseille and its surrounding districts. The company is also working on similar projects in other parts of the world.

Its technology relies on another form of osmosis. Instead of a membrane that allows only water molecules to pass from one solution to another, the company uses membranes that let through charged particles, known as ions, instead. The movement of ions creates an electric potential difference, which is the basis of a battery. The resulting charge is then used to produce a current directly.

The osmotic generators beside the Rhone are built by stacking together a series of ion-selective membranes and flowing through them fresh and salty water, which has been extracted from different points in the delta. Although the ion-transfer process has been known about for a number of years, the cost of making the required membranes has been prohibitive. Mr Heuzé says the company has developed cheaper and more effective versions using nanotube structures made from natural materials, such as wood. The details, however, remain proprietary.

The company eventually hopes to generate electricity at a levelised cost (an industry measure which accounts for capital and running expenses over a project's lifespan) below \$100 per megawatt hour. Some forms of solar and wind power can work out cheaper, but their intermittency—the sun does not always shine and the wind does not always blow—means batteries are needed for a sustained output. However, Mr Heuzé points out that so long as the river flows to the sea, osmotic power could generate electricity day and night, whatever the weather. ■

Well informed

Should adults take colostrum?

Claims for “first milk” have been exaggerated, but trials point to some benefits

A BREASTFED BABY'S first food is colostrum, a syrupy, yellowish fluid that, within days, is replaced by breastmilk. “First milk”, as colostrum is also known, is rich in nutrients, antibodies, antimicrobial proteins and amino acids that promote tissue growth. This helps newborns get off to a good start. Might colostrum, therefore, benefit adults too?

Colostrum from cows has long been added to various foods in places including Britain, India, Turkey and Scandinavia. Lately, demand has soared. An American retail-analytics firm, SPINS, noted in March that annual sales of colostrum supplements, sold as liquid, powder and capsules, had risen by 155% in the previous year. Enthusiasts claim the “liquid gold” reduces inflammation, aids digestion and immune function. It strengthens muscles, they add, boosts aerobic capacity and rejuvenates skin.

The science is mixed. Start with the immune response. In trials in Poland with 28 swimmers and triathletes, intervention groups were given 25 grams of bovine colostrum—a high dose—every day for 12 weeks. The researchers measured a modest but “favourable” increase in salivary immunoglobulin A, a mucosal antibody that binds to and neutralises bacteria, toxins and viruses. This seems to curb upper-respiratory illness, according to a review of five randomised con-

trolled trials with a total of 152 exercising participants. Writing in 2016 in *BMC Sports Science, Medicine and Rehabilitation*, the authors found that colostrum reduced episodes of such sickness by 38%. Recovery was also faster.

Those studies, however, were limited to athletes exercising intensely enough to have weakened their immune systems. The trials were also small. And other studies have found colostrum to provide little or no improvement in immune response, even with large doses.

The evidence on gut health is stronger. In a trial in Uganda involving 84 adults with chronic diarrhoea associated with HIV, half were given, in addition to standard therapy, a colostrum supplement. Their diarrhoea tapered off much sooner. After nine weeks, patients in the intervention group had also, on average, increased their body weight by 11%. Participants given standard therapy, but not colostrum, had not recovered weight, the researchers reported in 2011 in the *Indian Journal of Gastroenterology*.

Such results are attributed to colostrum's antibodies and antimicrobial proteins such as lactoferrin and lactoperoxidase. These appear to better seal the intestinal lining, reducing “leaky gut” in which inflammatory germ fragments pass into the bloodstream.

By reducing inflammation, colostrum also seems to boost aerobic capacity. And it probably helps that lactoferrin, by binding to iron in the blood, helps blood cells to deliver oxygen. A small trial published in April in the *European Journal of Sport Science (EJSS)* found that athletes who took 25 grams of colostrum per day for 12 weeks had higher oxygen uptake than those on a placebo.

Such findings are encouraging, but boosters have taken some claims too far. The *EJSS* study, for example, found no gain in muscle mass. As for skin, no peer-reviewed trials of ingested colostrum's purported benefits have been published. With the picture thus mixed, colostrum's cost shouldn't be an afterthought. Just three or so grams a day can add up to more than \$60 a month.



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Culture



Netflix and the business of hit-making

Stranger strategies

The streaming company lures fans out of their homes in a bid to build buzz

NEARLY TEN years after it first sent shivers down spines, “Stranger Things”, Netflix’s paranormal adventure, returned for its fifth and final season on November 26th. The quirky drama, set in Indiana in the 1980s, follows a group of intrepid youngsters who battle monsters from another dimension they call the Upside Down. (A nearby laboratory, disregarding health and safety, opened a portal between worlds.) The Duffer brothers, who created the show, were inspired by the science-fiction films of that era as well as tales of secret government experiments during the cold war.

“Stranger Things” was one of the streamer’s first big original hits and it is still going strong. In the first half of this year subscribers spent nearly half a billion hours watching the first four seasons. The show has swayed global culture. It has helped bring retro garb, such as oversized denim jackets, back into fashion. It has

contributed to the growing popularity of “Dungeons & Dragons”, a fantasy role-playing game loved by the show’s characters. And it has influenced what people listen to. In 2022, after “Running Up That Hill” featured on the soundtrack for season four, streams of Kate Bush’s song surged by more than 8,000%. The song topped the charts in Britain almost 40 years after it was released.

The grand finale will be a cultural event, and an extra-strange one at that: on

New Year’s Eve the last episode will be shown not just on Netflix, but in cinemas. Ted Sarandos, Netflix’s co-chief executive, reaffirmed his view in April that watching movies on the big screen was “an outmoded idea, for most people”. Yet as it tries to turn its popular shows into enduring franchises, Netflix increasingly sees a use for old-school platforms, from cinema to in-person events. Hollywood’s most high-tech company is using low-tech methods to make its shows travel farther still.

Netflix has created many original hits, from “Stranger Things” to “Squid Game”. With more than 300m subscribers around the world it has an ability like few others to inject ideas into global popular culture. But it has yet to find its Mickey Mouse or its “Star Wars”: the kind of triple-A-rated franchises that children want printed on their pyjamas and which they later introduce to their own offspring.

That would be a tall order for a company that has been making its own shows for little more than a decade. Netflix is nearly a century younger than most of its rivals; perhaps one day the demogorgons of “Stranger Things” will be as recognisable as Sir Ridley Scott’s aliens. In the meantime, one solution could be to buy some top-tier intellectual property from others. Netflix is said to have made a long-shot bid to acquire Warner Bros Discovery, »

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whose back catalogue contains blue-chip megafranchises such as “Lord of the Rings” and “Harry Potter”, with vast fanbases and potential for spin-offs.

Yet Netflix has always preferred to build, rather than buy. So for now it is finding new ways to burrow its own brands deeper into the hearts of fans. “Stranger Things” is not the only Netflix project getting the big-screen treatment. “KPop Demon Hunters”, a hit anime musical that launched on the streaming service in June, was given a “singalong” cinematic release two months later, and got another short theatrical run over Halloween.

Guillermo del Toro’s “Frankenstein” film hit cinemas almost three weeks before it reached the small screen. “Wake Up Dead Man”, the new “Knives Out” movie, will follow a similar schedule (see Back Story). In 2026 “The Adventures of Cliff Booth”, a comedy-drama starring Brad Pitt, will probably get a cinematic release when it comes out in the summer, as will “Narnia” in the autumn.

Just the ticket

Netflix has long paid lip service to the silver screen, giving about 30 films a year an airing at the cinema so they can qualify for Oscar nominations (a Best Picture gong still eludes the company). Theatrical runs also help lure star directors like Greta Gerwig, who was unwilling for “Narnia” to go straight to TV. Netflix is said to have promised Warner Bros that it would continue to release the studio’s films in cinemas, if its bid is accepted.

These days Netflix is able to negotiate better terms with cinema operators, too. Before covid-19, most insisted that films got a 90-day exclusive run in their auditoriums. These days they cannot afford to be so choosy. Some theatres are hiring out their screens to people who want to plug in their PlayStation for a birthday party. Showing a months-old movie like “KPop Demon Hunters”, or a TV episode like “Stranger Things”, is something they are willing to contemplate.

In the home, Netflix is reaching for other old-school tactics to heighten the buzz around its shows. One of its signature innovations was the simultaneous release of entire series, to enable bingeing. It now seems to take the view that, in some cases, the traditional practice of dripping out episodes increases excitement. Recent seasons of shows like “Bridgerton” and “Emily in Paris” have been released in two batches. The eight new episodes of “Stranger Things” will be dropped in three helpings—around Thanksgiving, Christmas Day and New Year’s Eve—to keep people in a state of fearful anticipation.

The streamer is giving its hit shows greater depth by commissioning spin-offs. Netflix may regret the end of “Stranger

Things”, which has been responsible for more than \$1bn in subscription revenue over the past five years, according to Parrot Analytics, a data company. But it will keep fans going with an animated offshoot, due next year, called “Tales from ’85”, as well as a live-action spin-off still in its early stages. Other high-performing series have been similarly fleshed out, with supporting projects including a reality competition show based on “Squid Game” and “Queen Charlotte”, a mini-series set, like “Bridgerton”, in Regency-era England.

Netflix is also creating more in-person experiences. For years it has experimented with temporary events, from “Bridgerton” balls to “Money Heist” escape rooms. On November 12th the streamer opened the first Netflix House, a kind of indoor theme park, in Philadelphia, where attractions include “Wednesday”-themed games and a restaurant serving Netflix-inspired dishes. A second branch, with a “Stranger Things” experience, will open on December 11th in Dallas. Las Vegas is next, in 2027, with other venues promised.

These are a far cry from Disney’s sprawling parks and resorts, which contribute the largest share of the firm’s profits. Netflix House is overseen by the company’s marketing department. The scope for shareable selfies—on velvet “Bridgerton” thrones, for example—will help keep brands top of mind between seasons. Netflix is “extracting incremental revenue from superfans while reinforcing a property’s position in the cultural conversation ahead of its next cycle”, says Christofer Hamilton of Parrot Analytics.

For all its experiments, Netflix remains convinced that streaming is the best way to create global hits. Historically, cinematic release has given movies a wave of publicity which they have ridden through video rental and then TV. But on a recent earnings call, Mr Sarandos mused that the hit-making process can now work the other way round. In the case of “KPop Demon Hunters”, he said, “It was the superfans who...repeat-watched the movie that drove the recommendation engine that got it in front of more superfans.” Viewing at home let audiences learn the songs, make up the dances and post them on social media—ultimately creating a film that people wanted to see at the cinema. “We believe that...‘KPop Demon Hunters’ actually worked because it was released on Netflix first,” Mr Sarandos said.

When it comes to “Stranger Things”, fans may want to witness the gang’s final showdown with Vecna, a terrifying psychic being, in a room with other people. Communal watching heightens the thrills and chills; of all the genres, horror is the one people still go to the cinema to watch. In the streaming age, the business of hit-making has gone into the Upside Down. ■

Fan favourites

Animal magnetism

The capybara has become an unlikely internet darling

FOR THE most part, rodents make people shriek in disgust. But the largest rodent of all, strangely, does not. The capybara, a hirsute native of South America, typically provokes squeals of delight. It is pictured on keyrings, backpacks and stationery. Spend £40 (\$52) and you can get a luxuriously soft capybara toy for your bedroom. For under £10 you can get an advent calendar containing 24 different ornaments, depicting *Hydrochoerus hydrochaeris* as an astronaut, magician or detective.

The capybara has become something of a cultural idol. There are capybara cafés in America, Indonesia, Taiwan and Thailand; one is expected to open in Britain soon. A catchy song—its lyrics are mainly “capybara”, repeated over and over—has more than 33m streams on Spotify. On TikTok almost 700,000 posts bear the hashtag #capybara—more than other cuties like the #koala (210,000) or #otter (190,000).

The craze began in Japan in the 1980s. Keepers at Izu Shaboten Park, a botanical garden and zoo in Shizuoka, noticed that the capybaras plonked themselves down in warm puddles after the enclosure had been cleaned and so built them their own *onsen*. Capybaras are semi-aquatic and loved the hot baths; visitors loved watching them bathe. Another park, in Nagasaki, is known as “the holy land of capybaras” as visitors can pet and feed around 20 of them.

Brands soon realised capybaras’ mer- ▶▶



Pretty cappy

▶ chandising potential. In the 2000s Bandai, a Japanese toymaker, created Kapibara-san (Mr Capybara) as an item that could be won in arcades; within a few years Kapibara-san became a hit anime character. Kapibara-san, much like Hello Kitty, was then exported around the world. The internet also allowed people to discover capybaras along with other niche animals such as axolotls (a type of salamander).

Now fans make pilgrimages to see the hairy darlings. Hertfordshire Zoo in Brit-

ain acquired a breeding pair in 2022 and is enjoying more visitors than ever. The zoo's capybara experience, where guests can give the animals scratches and pose for photos, is almost sold out for the next year.

Capybaras are not endangered. They have small eyes, large, blunt snouts, bristly fur and ungainly webbed feet. So what gives? Capybaras appeal because they look as though they are unbothered by the vicissitudes of the world. They always wear a cool, calm and collected expression,

whether they are eating a snack, being approached by an iPhone-wielding stranger or interacting with other beasts. They have earned the sobriquet of "the chilliest animal on Earth"; some joke that the collective noun for the mammal should be a "meditation", so zen is their vibe. At a time when people talk of ever-increasing anxiety and burnout, these animals' unflapability is almost aspirational. Lounging in their pools, capybaras remind stressed-out humans to go with the flow. ■

BACK STORY

Murder, by rote

The new "Knives Out" mystery spotlights the clash at the heart of an unkillable genre

"NOT MORE than one secret room or passage is allowable." So decrees one of the ten commandments of detective fiction distilled by Ronald Knox, a friend of Agatha Christie, during the genre's inter-war golden age. Unknown poisons are out, as are "all supernatural or preternatural agencies".

Murder mysteries are governed by conventions. That is part of their consoling charm: they are a safe sort of danger, in which, even as corpses and red herrings pile up, you know roughly what to expect. In cinemas now and on Netflix soon, "Wake Up Dead Man" deliciously illustrates the fun and freedom of the formula. An heir to Knox could compile a modern set of rules from the tropes it revels in. The tension at its heart has powered the genre from the start.

In this third and best film in the "Knives Out" whodunnit franchise, a hoodlum-turned-priest, Jud Duplencity (played by Josh O'Connor, pictured left), is dispatched by his superiors to a dysfunctional congregation in upstate New York. Its tyrannical overlord, Jefferson Wicks (Josh Brolin), is elaborately murdered. Jud is the prime suspect.

Great detective stories often feature a cocooned setting—a snowbound hotel, a cruise on the Nile—which forces the characters into dangerous proximity and keeps them there. It can also serve as a microcosm of wider society. A locked or otherwise inaccessible murder scene is handy, too. Here Rian Johnson, the director, picks a remote church with gothic fixtures and crepuscular lighting, duly staging what the dialogue calls "a textbook example of a perfectly impossible crime". A cemetery crypt has a "Lazarus door" that opens only from the inside. Will it open, do you think?

The detective in a murder mystery



underwrites the peril: you may not know who the killer is, but you know a guy or girl who does. The best are walking brands, with illustrious case histories and idiosyncrasies. Sherlock Holmes had his pipe and violin; Mr Johnson's sleuth, Benoit Blanc (Daniel Craig, pictured right), is a quirky dresser with a Southern drawl. Like Hercule Poirot he is confident but compassionate, formidable yet faintly comic; cerebral with a hint of clown.

As convention dictates, he has a sidekick. This figure is a foil for the detective's brilliance and an avatar for the audience. You can't imagine being Holmes, Poirot or Blanc, but perhaps you could be Watson or Hastings—or blundering, kindly Jud.

Rule-bound as they are, though, successful murder mysteries, like other populist art, are also mirrors of their time. Money and lust are recurring themes, but otherwise motives and contexts vary. "Wake Up Dead Man" depicts a small-town fusion of reactionary politics and harsh religion. Wicks, the victim, inspires fierce devotion in his flock by "keeping them angry and afraid". Jud is derided as a

"PINO", or Priest In Name Only.

An unwritten but cardinal law of the form on screen is: have a blast! The room may be locked, but there should be a party inside it, buzzing with gorgeous people, some of whom die, and a high quotient of maniacs. Since by itself it can be a let-down, murder should be only part of the spectacle. (As John Dickson Carr writes in "The Hollow Man", a novel cited in the movie, when the locked room is explained, "in some vague way we are disappointed.") Directors should lay on lush locations and casts—Mr Johnson's includes Mila Kunis and Glenn Close—and lots of jokes. Look out, here, for the snacking pathologist.

Amid the self-referential high jinks, however, "Wake Up Dead Man" spotlights the genre's fundamental clash. Murder mysteries pit wily detectives against scheming assassins (and bumbling plods). But those are only proxies for hidden forces, towards which Knox's ban on the supernatural offers a clue.

Detective fiction emerged in the 19th century as science, including the evolutionary and forensic kinds, advanced. Reason rattled faith. Fictional detectives were omniscient idols of a secularising world, even if, like Poirot, they professed belief. Together the sleuths unravel not just individual mysteries but the concept of mystery; the idea that some truths are too deep for mortals to fathom.

Rationalist Blanc disputes with spiritual Jud, envisaging this fiendish case as his "final checkmate over the mysteries of faith". He gathers the suspects for his summation, an earthly take on the last judgment, sin and hellfire transmuted into logic and proof. It doesn't go quite as he plans. Predictable as it seems—or because it seems predictable—the murder mystery can still surprise.

Movie musicals

Gravity-defying success

Why the “Wicked” films are producing box-office magic

IT IS HARD to decide the wackiest thing about “Wicked”. Perhaps it is the fact that in Oz, the musical’s magical setting, animals work. (A goat is a historian; an owl a preacher.) Perhaps it is that the bad witch (Cynthia Erivo) has green skin—or that the good witch (Ariana Grande) almost exclusively wears pink and uses words like “hideodious” and “obsessulated”.

However hideodious this all may sound, Hollywood is obsessulated. A two-part “Wicked” musical-movie extravaganza has struck a chord. The first instalment took more than \$750m at the global box office to become one of the highest-grossing film adaptations of a Broadway musical. In America no film has outperformed “Wicked” since it was released a year ago. “Wicked For Good”, the second part, was released on November 21st and is outpacing its predecessor in ticket sales. It has already made more than \$235m. Why are the films proving so spellbindingly successful?

There are three reasons. First, the movies are part of a much-loved franchise. “Wicked” is adapted from a musical by Stephen Schwartz and Winnie Holzman. The musical is based on a novel by Gregory Maguire which tells the story of the Wicked Witch of the West from “The Wonderful Wizard of Oz”, L. Frank Baum’s yellow-brick-road adventure of 1900. That novel was adapted into a hit film in 1939.

The second factor is the musical’s artistic merits. Critics sniffed when “Wicked”

opened on Broadway in 2003—an early review said the show was “more withered than wicked”—but audiences cheered. The musical has since been seen by over 70m theatregoers. The show is “very well written”, avers Paul Laird, the author of “Wicked: A Musical Biography”. Ballads such as “Defying Gravity” are uplifting; catchy tunes like “Popular” are not merely popular but tell a story, as in any good musical. It helps that the films’ leads, including Ms Grande, a pop star, can execute the soaring melodies to perfection.

The films, which had a combined budget of around \$300m, have also benefited from cinematic wizardry. The first movie won Oscars for costume and production design. On set were 9m tulips planted in a rainbow pattern, a functioning emerald-green locomotive and a road of actual yellow bricks. “Wicked” may usher in a wave of spectacular musical films: Jon Chu, the director, is already working on an adaptation of “Joseph and the Amazing Technicolor Dreamcoat” for Amazon.

The final reason for the success of “Wicked” is a bewitching advertising campaign. At a time when films seem to have fading cultural relevance, Universal’s marketing department made this one inescapable. The studio partnered with more than 400 brands to peddle everything from pink and green Le Creuset cookware (the set is \$900) to pink and green laundry detergent and pink and green macaroni cheese. Fans can visit Greggs, a bakery chain, and “follow the yellow bake road” to buy a limited-edition coffee cup.

The effect of all this is akin to being unwillingly stranded in Oz, rather like Dorothy and Toto in Baum’s story. It points to Hollywood’s cosy relationship with brands. Blockbuster movies have long entered into these kinds of partnerships—franchises from James Bond to Barbie have

sought product-placement deals and licensing agreements—but “Wicked” has taken it further than most. Promotions for the first movie generated more than \$330m of “media value”, a gauge of the monetary benefit of brand deals, reportedly the most ever for a Hollywood film.

So by now many will be done with “Wicked” for good, never mind “Wicked For Good”. The second half—a nearly two-and-a-half-hour film spun out of an hour-long musical act—often feels unnecessary, even as it introduces new songs and new silly phrases. (Characters say “just a clock tick”, ie, just a second, with alarming frequency.) The singing is still marvellous and the sets mesmerising, but after two years of persistent pink and green, viewers may find themselves counting down the clock ticks until its conclusion. ■

The history of biology

Prickly pioneer

Crick: A Mind in Motion.

By Matthew Cobb. *Basic Books*; 608 pages; \$36. *Profile Books*; £30

IN FEBRUARY 1953, after five weeks of intense work, Francis Crick and James Watson solved one of biology’s most fundamental puzzles: the structure of DNA. Their discovery—the double helix—had little to do with Crick’s doctoral thesis at Cambridge, but it was the problem that fascinated him most at the time. Other scientists had been closing in on the structure. Crick was, as one of his contemporaries put it, “the sort of chap who was always doing someone else’s crossword”.

After the double helix came many more discoveries, often on other scientists’ turf. Crick proposed the mechanism by which DNA was translated into protein and helped crack the genetic code. He contributed to the understanding of collagen’s structure, devised prescient theories of embryonic development and later turned his attention to the neural basis of consciousness. A new biography by Matthew Cobb, a zoologist at the University of Manchester, uses these discoveries to study the mind that produced them, revealing the traits that made Crick one of the 20th century’s greatest scientists.

Crick was competitive—sometimes unscrupulously so—and unafraid of offending others. In Britain the race to determine DNA’s structure was centred not around Cambridge, but King’s College London, where Maurice Wilkins and Rosalind



The witch is back

Franklin were taking X-rays of DNA fibres. Crick's and Watson's success depended in part on data from King's that they used without permission. (In 1962 Crick, Watson and Wilkins shared the Nobel prize in medicine; Franklin had died in 1958.)

He excelled at explaining scientific ideas and often did so to the public. Crick's lectures were famous for their energy and scope; his research papers are still admired for their clarity. Most of his best ideas came from conversations with peers. In Cambridge he bounced hypotheses off Watson and then Sydney Brenner; later in life, after his move to the Salk Institute in San Diego, Christof Koch, a neuroscientist, became his sparring partner. Colleagues reported hearing Crick constantly "prattle away in his loud voice".

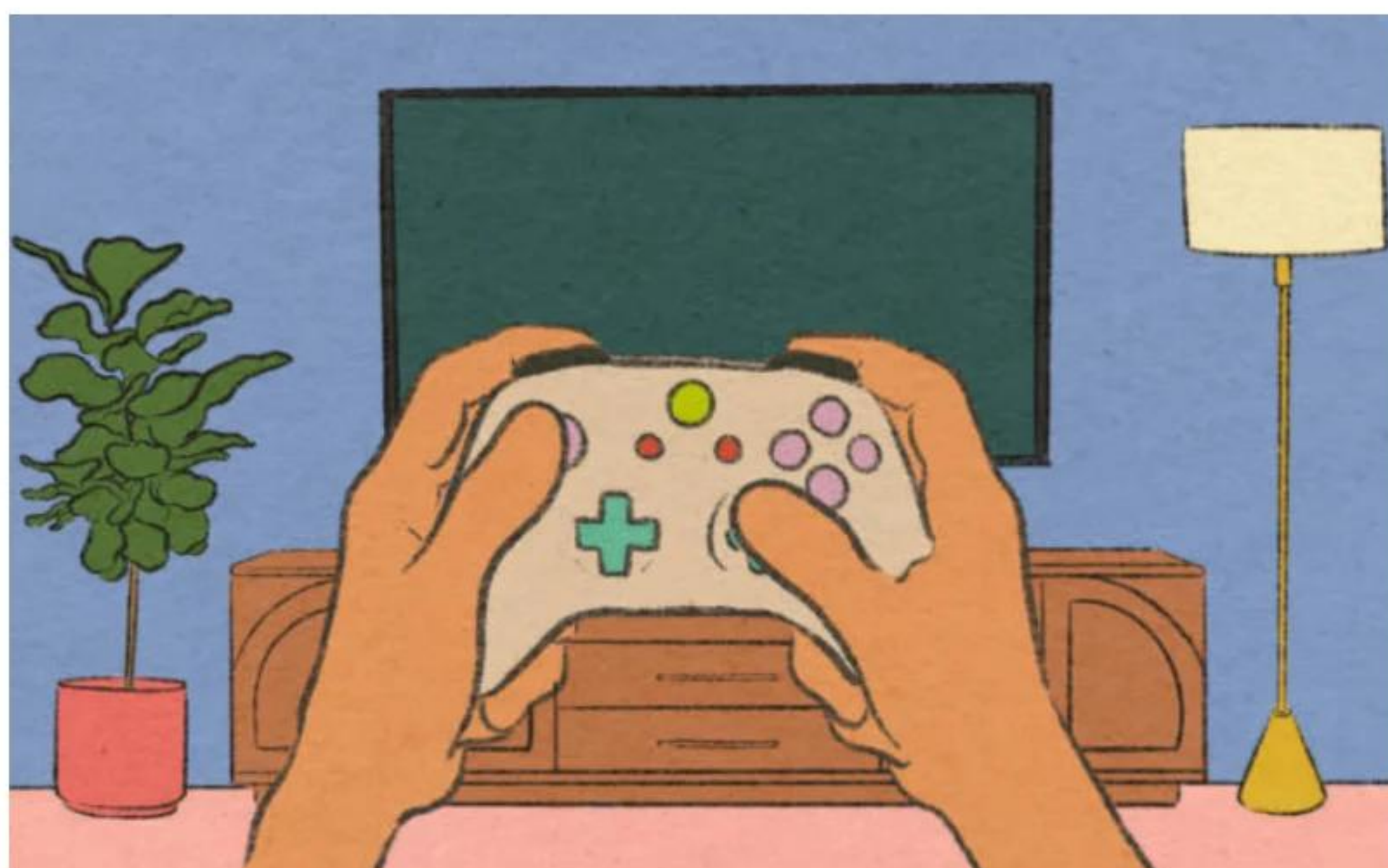
In these "mad sessions", Crick tested ideas to see which survived contact with reality. He was analytical, but his biggest discoveries relied on trial and error and on what he called his "don't worry method". A theory, he argued, should not be rejected merely because some evidence failed to fit: data could be flawed and measurements could be wrong. The art was knowing which anomalies to discard—a matter, he thought, of "biological intuition".

Yet Crick was not afraid to be wrong. Before settling on the double helix, he proposed a triple one. He published an incorrect structure of collagen and a mistaken theory about the genetic code. In one paper he argued that life on Earth began from microbes sent by extraterrestrial beings.

His unconventional career also probably contributed to his success. Crick came to science late, completing his PhD at 37. He preferred theory to experiments, leaving the fiddly, time-consuming lab work to others. He did very little admin or teaching. Unlike most academics, past and present, he had the privilege of spending most of his time reading and thinking.

This captivating biography is deeply researched and elegantly written. Crick is painted as an extraordinary mind—bold, curious and combative—and the book offers a glimpse of his colourful personal life, replete with parties, affairs, drugs and feuds. Professor Cobb does not shy away from describing his subject's flaws: he points, for instance, to Crick's interest in eugenics. But on the whole he is most interested in Crick's scientific contributions.

Had Crick and Watson not got there first, the structure of DNA would soon have been solved by someone else. But it was Crick's grasp of the double helix's implications that propelled biology forward. In the structure he deduced how DNA replicated itself and concluded that the sequence of bases was the source of genetic information. It may have been someone else's crossword, but science is richer for Crick's intervention. ■



The best video games of 2025

Play it cool



With these titles you can try your luck as a museum curator, detective or samurai

"Cabernet"

This game, set in eastern Europe in the 19th century, follows Liza, a vampire. Players are forced to make moral choices as they seek victims, befriend them and then drink their blood.

"Civilization VII"

For over 30 years the "Civilization" games have allowed gamers to explore how societies grow into empires. This title is perhaps the most ambitious to date. Players transition through ancient, medieval and modern times.

"Death Stranding 2: On the Beach"

This game is set in a world where almost everyone is locked inside, terrified of a hostile world. (Sound familiar?) Players deliver parcels in this wonderfully strange story full of enigmatic characters and enjoyable quests.

"Donkey Kong Bananza"

Nintendo produced this game—in which Donkey Kong smashes stuff in search of rewards—to accompany the launch of its Switch 2 console. It demonstrates the firm's enduring design sensibilities.

"Ghost of Yotei"

A vengeful samurai murders her way through enemy territory. The missions are fun, but it is a pleasure to wander round this splendidly rendered version of 17th-century Japan.

"Hades II"

Melinoe enters the underworld to defeat Chronos, the Titan of time. The game's fights feature cleverly designed versions of Greek mythological figures. Success in battle is hard-won.

"Hollow Knight: Silksong"

Developed over the course of almost a decade, "Hollow Knight: Silksong" is extremely difficult. Players have to negotiate a labyrinth while overcoming an impressive array of baddies and obstacles.

"The Roottrees are Dead"

A rich family have died in a plane crash. In this detective game, it is your job to find out who will inherit their wealth. As you pore over documents and diaries, you realise the family had plenty to hide.

"Split Fiction"

A tech company steals authors' story ideas and turns them into simulated worlds. When two writers agree to test out "The Machine", they have to escape prisons of their own imagination. An intelligent multiplayer game.

"Two Point Museum"

The previous "Two Point" games offered humorously subtle takes on managing a hospital and a university. Now comes a museum. Decisions must be made on everything from wages to the placement of prized exhibits. ■



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Economic & financial indicators

	Gross domestic product				Consumer prices			Unemployment		Current-account		Budget		Interest rates		Currency units		
	% change on year ago				% change on year ago			rate		balance		balance		10-yr gov't bonds	change on	per \$	% change	
	latest	quarter*	2025 [†]		latest	2025 [†]		%		% of GDP, 2025 [†]	% of GDP, 2025 [†]		latest, %	year ago, bp	Nov 26th	on year ago		
United States	2.1	Q2	3.8	1.9	3.0	Sep	2.8	4.4	Sep	-4.0		-5.9		4.0		-30.0	-	
China	4.8	Q3	4.5	5.1	0.2	Oct	-0.1	5.1	Oct [§]	2.0		-5.6		1.6	\$\$	-12.0	7.08	2.3
Japan	1.1	Q3	-1.8	1.0	3.0	Oct	3.1	2.6	Sep	4.3		-2.9		1.8		73.0	156	-1.2
Britain	1.3	Q3	0.3	1.4	3.6	Oct	3.8	5.0	Aug ^{††}	-3.0		-4.9		4.6		17.0	0.76	5.3
Canada	1.2	Q2	-1.6	1.1	2.2	Oct	2.0	6.9	Oct	-2.0		-2.6		3.1		-16.0	1.41	-0.7
Euro area	1.4	Q3	0.9	1.3	2.1	Oct	2.1	6.3	Sep	3.2		-3.2		2.7		49.0	0.86	10.4
Austria	0.3	Q2	-0.5 [†]	0.4	4.0	Oct	3.4	5.5	Sep	2.1		-4.5		3.0		30.0	0.86	10.4
Belgium	1.1	Q3	1.2	1.1	2.5	Oct	3.0	5.9	Sep	-0.6		-5.3		3.2		41.0	0.86	10.4
France	0.9	Q3	2.0	0.7	0.8	Oct	1.0	7.6	Sep	-0.3		-5.7		3.4		36.0	0.86	10.4
Germany	0.3	Q3	nil	0.2	2.3	Oct	2.2	3.9	Sep	5.2		-2.7		2.7		49.0	0.86	10.4
Greece	1.7	Q2	2.3	2.2	1.6	Oct	2.8	8.2	Sep	-5.8		0.6		3.3		19.0	0.86	10.4
Italy	0.4	Q3	-0.2	0.5	1.3	Oct	1.7	6.1	Sep	1.2		-3.1		3.4		-6.0	0.86	10.4
Netherlands	1.6	Q3	1.5	1.5	3.0	Oct	2.9	4.0	Oct	7.8		-2.4		2.8		38.0	0.86	10.4
Spain	2.8	Q3	2.6	2.8	3.2	Oct	2.5	10.5	Sep	2.7		-2.8		3.2		16.0	0.86	10.4
Czech Republic	2.3	Q2	1.8	2.5	2.5	Oct	2.4	2.8	Q3 [†]	0.7		-2.1		4.5		64.0	20.9	15.4
Denmark	3.9	Q3	9.5	2.5	2.1	Oct	1.8	2.9	Sep	12.2		2.1		2.5		53.0	6.46	10.1
Norway	2.1	Q3	4.6	1.1	3.1	Oct	2.8	4.7	Aug ^{††}	13.6		9.5		4.1		45.0	10.2	8.4
Poland	3.7	Q3	3.2	3.3	2.8	Oct	3.8	5.6	Oct [§]	-0.6		-7.0		5.2		-36.0	3.65	12.6
Russia	0.6	Q3	na	0.6	7.7	Oct	8.8	2.2	Sep [§]	1.8		-2.7		14.4		-199	79.0	31.4
Sweden	1.8	Q3	4.5	1.6	0.9	Oct	2.7	8.9	Oct [§]	6.5		-1.3		2.7		69.0	9.53	15.2
Switzerland	1.3	Q2	0.6	1.2	0.1	Oct	0.2	3.0	Oct	4.5		0.5		0.2		-14.0	0.81	9.9
Turkey	4.8	Q2	6.6	3.2	32.9	Oct	34.5	8.6	Sep [§]	-1.2		-3.6		29.8		227	42.4	-18.5
Australia	1.8	Q2	2.4	1.9	3.2	Q3	2.7	4.3	Oct	-2.1		-1.8		4.4		-15.0	1.55	-0.7
Hong Kong	3.8	Q3	2.8	3.1	1.2	Oct	1.6	3.8	Oct ^{††}	13.3		-4.9		2.9		-49.0	7.78	0.1
India	7.8	Q2	7.4	6.8	0.3	Oct	2.8	7.5	Oct	-1.0		-4.4		6.5		-33.0	89.2	-5.5
Indonesia	5.0	Q3	4.1	5.0	2.9	Oct	1.9	4.9	Aug [§]	-1.1		-3.1		6.2		-68.0	16,640	-4.6
Malaysia	5.2	Q3	9.0	4.8	1.3	Oct	1.4	3.0	Sep [§]	1.1		-3.9		3.4		-40.0	4.13	7.7
Pakistan	3.7	2025 ^{**}	na	3.7	6.2	Oct	3.5	6.3	2021	-1.5		-5.5		11.9	†††	-29.0	282	-1.3
Philippines	4.0	Q3	1.6	5.0	1.7	Oct	1.6	5.3	Q3 [§]	-3.8		-5.7		5.9		-20.0	58.8	0.2
Singapore	4.2	Q3	9.8	3.7	1.2	Oct	0.8	2.0	Q3	14.6		0.2		2.1		-69.0	1.30	3.1
South Korea	1.7	Q3	4.7	1.1	2.4	Oct	2.1	2.2	Oct [§]	5.5		-2.4		3.3		35.0	1,466	-4.5
Taiwan	7.6	Q3	5.3	7.2	1.5	Oct	1.7	3.3	Oct	18.4		1.8		1.3		-26.0	31.4	3.3
Thailand	1.2	Q3	-2.2	1.8	-0.8	Oct	-0.1	0.7	Oct [§]	2.0		-5.8		2.1		-48.0	32.3	7.2
Argentina	6.3	Q2	-0.2	3.8	31.3	Oct	41.8	7.6	Q2 [§]	-2.3		0.1		na		na	1,447	-30.5
Brazil	2.2	Q2	1.5	2.2	4.7	Oct	5.0	5.6	Sep ^{§††}	-3.2		-6.4		13.6		77.0	5.38	7.8
Chile	1.6	Q3	-0.6	2.4	3.4	Oct	4.3	8.5	Sep ^{§††}	-2.6		-1.7		5.3		-52.0	936	4.3
Colombia	3.4	Q3	5.0	2.5	5.5	Oct	5.0	8.2	Sep [§]	-2.5		-7.5		12.4		198	3,806	15.1
Mexico	-0.1	Q3	-1.1	0.7	3.6	Oct	3.8	2.7	Sep	-0.4		-3.8		9.0		-102	18.4	10.4
Peru	3.4	Q3	5.7	3.1	1.4	Oct	1.6	5.5	Oct [§]	1.9		-2.5		5.7		-105	3.38	11.8
Egypt	5.2	Q3	38.9	4.3	12.5	Oct	14.1	6.4	Q3 [§]	-2.5		-7.7		na		na	47.8	3.8
Israel	3.5	Q3	12.4	3.4	2.5	Oct	3.1	3.0	Oct	2.7		-4.5		3.9		-59.0	3.28	11.0
Saudi Arabia	2.7	2024	na	4.4	2.2	Oct	2.1	3.2	Q2	-2.2		-5.3		na		na	3.75	nil
South Africa	0.6	Q2	3.4	1.2	3.5	Oct	3.3	31.9	Q3 [§]	-0.8		-4.4		8.6		-47.0	17.2	4.8

Source: Haver Analytics *% change on previous quarter, annual rate †The Economist Intelligence Unit estimate/forecast ‡Not seasonally adjusted *New series **Year ending June ††Latest 3 months †††3-month moving average
[§]5-year yield †††Dollar-denominated bonds Note: Euro-area consumer prices are harmonised

Markets

In local currency	Index	% change on:	
		one	Dec 31st
	Nov 26th	week	2024
United States S&P 500	6,812.6	2.6	15.8
United States NAS Comp	23,214.7	2.9	20.2
China Shanghai Comp	3,864.2	-2.1	15.3
China Shenzhen Comp	2,433.1	-1.6	24.3
Japan Nikkei 225	49,559.1	2.1	24.2
Japan Topix	3,355.5	3.4	20.5
Britain FTSE 100	9,691.6	1.9	18.6
Canada S&P TSX	31,180.3	3.0	26.1
Euro area EURO STOXX 50	5,655.6	2.0	15.5
France CAC 40	8,096.4	1.8	9.7
Germany DAX*	23,726.2	2.4	19.2
Italy FTSE/MIB	43,130.3	1.1	26.2
Netherlands AEX	943.7	1.1	7.4
Spain IBEX 35	16,361.1	3.0	41.1
Poland WIG	111,677.8	1.3	40.3
Russia RTS, \$ terms	1,069.5	3.9	19.7
Switzerland SMI	12,822.2	2.3	10.5
Turkey BIST	10,914.7	0.1	11.0
Australia All Ord.	8,899.3	2.0	5.7
Hong Kong Hang Seng	25,928.1	0.4	29.3
India BSE	85,609.5	0.5	9.6
Indonesia IDX	8,602.1	2.3	21.5
Malaysia KLSE	1,624.5	nil	-1.1

	Index	% change on:	
		one	Dec 31st
	Nov 26th	week	2024
Pakistan KSE	163,188.5	0.6	41.7
Singapore STI	4,501.6	-0.1	18.8
South Korea KOSPI	3,960.9	0.8	65.1
Taiwan TWI	27,409.5	3.1	19.0
Thailand SET	1,261.2	-0.9	-9.9
Argentina MERV	2,985,631.8	4.0	17.8
Brazil BVSP*	158,554.9	2.0	31.8
Mexico IPC	63,230.6	1.9	27.7
Egypt EGX 30	39,537.3	-2.4	32.9
Israel TA-125	3,419.5	-0.5	40.9
Saudi Arabia Tadawul	10,635.4	-3.3	-11.6
South Africa JSE AS	111,861.7	-0.1	33.0
World, dev'd MSCI	4,334.5	1.6	16.9
Emerging markets MSCI	1,353.8	-0.5	25.9

US corporate bonds, spread over Treasuries

	Dec 31st	
	latest	2024
Basis points		
Investment grade	99	95
High-yield	375	324

Sources: LSEG Workspace; Moscow Exchange; Standard & Poor's Global Fixed Income Research *Total return index

Commodities

The Economist commodity-price index				
2020=100	Nov 18th	Nov 25th*	month	% change on year
Dollar Index				
All items	138.3	137.2	-0.6	2.8
Food	146.1	142.7	-1.0	-2.8
Industrials				
All	131.9	132.7	-0.3	8.4
Non-food agriculturals	125.9	124.4	-1.3	-7.6
Metals	133.4	134.8	nil	13.0
Sterling Index				
All items	135.2	133.8	0.1	-2.0
Euro Index				
All items	136.4	135.6	0.2	-6.8
Gold				
\$ per oz	4,050.5	4,131.3	4.2	57.1
Brent				
\$ per barrel	64.9	62.6	-2.6	-14.8

Sources: Bloomberg; CME Group; FT; LSEG Workspace; NZ Wool Services; S&P Global Commodity Insights; Thompson Lloyd & Ewart; USDA; WSJ *Provisional

For historical indicators data, visit economist.com/economic-and-financial-indicators

OBITUARY

He Yanxin

The last natural inheritor of the nushu language died on October 23rd, aged 86



IN THE SUMMER of 1949, the year the Communists came to power in China, you might have found He Yanxin, then ten, sitting with her grandmother under a tree. It was cooler there, in the heat of the day. An ordinary scene, except that her grandmother was inscribing characters on the palm of Yanxin's small hand. As she did so, Yanxin would sing the character, then jump up to draw it with a twig on the sand. For her, these lessons were fun. But she wondered why writing this script made her grandmother cry, sometimes so much that she could not see.

Years passed; the Cultural Revolution violently came and went; she brought up six children amid the strains of poverty and a hard marriage. Then, from the early 1980s, researchers began seeking her out. She was not easy to find. Her home, Heyuan village, was tucked away in the foggy, vertiginous sandstone peaks of Jiangyong County in Hunan, in China's south-east. But the visitors came because Jiangyong was the only site of a mysterious ancient language used by women only. They had heard Yanxin knew it, one of very few; but once they found her, with her tough demeanour and her straight gaze, she would tell them, firmly, no.

The language was called *nushu*, "women's script". The characters were thin, slanting and graceful; locally they were called "long-legged mosquitoes" and "the words of ants". Standard Chinese ideograms were chunky by comparison. Visually it was easy to learn, with each character representing one syllable; but to sing it well (for it was sung rather than spoken) required knowing the local dialect. It was therefore a natural medium for rural women denied education, as they all were until Mao's time. Young unmarried women especially would meet to sing and sew *nushu* on fans, handkerchiefs and belts. When a bride left to live in the groom's house, the "Third Day Books" of commiserations and hopes for her were naturally written in *nushu*, women to women.

Nobody knew for sure how old it was. Some said a beautiful concubine in the medieval Song dynasty had invented it, others that it was the work of Yaoji, goddess of clouds and rain. Its secrecy was also disputed. Women certainly kept it to themselves, but men would have ignored it anyway. China was—still is—a patriarchy. *Nushu* was overwhelmingly filled with the grief and bitterness

of women who had exchanged their own families for abusive husbands, hateful mothers-in-law and bound feet that kept them home. Rather than moonlight and flowers, its most common images were of closed rooms, lost friends and pain like the slash of a sword. One of Yanxin's favourite images was of frost and snow on plum blossom: harsh beauty that destroyed life. Yet this was not a language of resistance. Many Third Day Books reminded a woman of her "Three Obediences": as a child, to her father; as a wife, to her husband; as a widow, to her sons. Brides were reminded to "serve your father-in-law with a smile".

Desperate or resigned, by 1960 Yanxin did not need these songs. In earlier times there had been "sworn sisterhoods", among the singers, "wisteria from the same root" which often proved stronger than ties of blood. But she herself had only one sworn sister, and they had lost touch. Learning *nushu* had also been an education, but under Mao all girls, like boys, could go to school. Then, slaving for her family, she had no time for it. One of her daughters asked if she would teach her, but she refused. What good was it? What money did it earn? It was useless.

Yet her subsequent claim that she knew nothing of *nushu* did not hold up for long. A Japanese researcher, Endo Orie, having got that denial on the doorstep, handed her a pen and paper. Clumsily, out of practice, she began to draw the characters; but rapidly they became graceful, and Ms Endo urged her to go on; to write her life. At that point, her husband was gravely ill in hospital. Even there he continued to blame her. She visited him but, like a boat without wind, she could do nothing. One night in the house alone, rather than despair, she made a start on Ms Endo's commission. *Nushu* made her cry too, but fortified her more. It was precious as gold to see the determined progress of the characters down the page. Her story poured out of her as if she had only been waiting to recover this near-dead language in order to speak.

There was so much to say. She was still a baby when her father was killed by a rapacious landlord, knocked to the ground and hit until his blood ran out. After childhood, she had barely one good day. With her father gone, no man sowed rice for them; at 19, she had to be married off. She refused, skipped the ceremony and for a few years was happy to live apart from him. When she finally went to her husband's house, it was pure oppression. She felt like a baby bird that could not chirp, let alone fly. Her mother-in-law hovered in the kitchen, criticising her cooking and complaining to her son, who then "served up the beating". Having abandoned his studies, he tried farming, while she hauled rocks in the mines.

This bitter therapy of *nushu* inspired her for the next two decades to help scholars research it. She also accepted the status of an "inheritor", the last woman to learn *nushu* naturally, in the family. She even acquired a *nushu* sister, Hu Xin, an eager young student, and helped her through her divorce as well as her chanting exercises. They would walk through the streets of Heyuan with their arms around each other.

She still had huge reservations, though. The *nushu* of the 21st century was not what she had learned. Men had now found uses for it, as a tourist lure. In Jiangyong you could buy trinkets with *nushu* inscriptions, often misspelled, and get a fan free with a bucket of fried chicken. In Pumei village an imposing *nushu* museum offered writing courses. But the songs were bland and pretty now, and young women very different. No one needed to understand—as she, now, fully understood—why her grandmother had so often wept as she inscribed the words of ants. ■

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