

The Economist

Will AI take over science?

Mysteries of the Musk Foundation

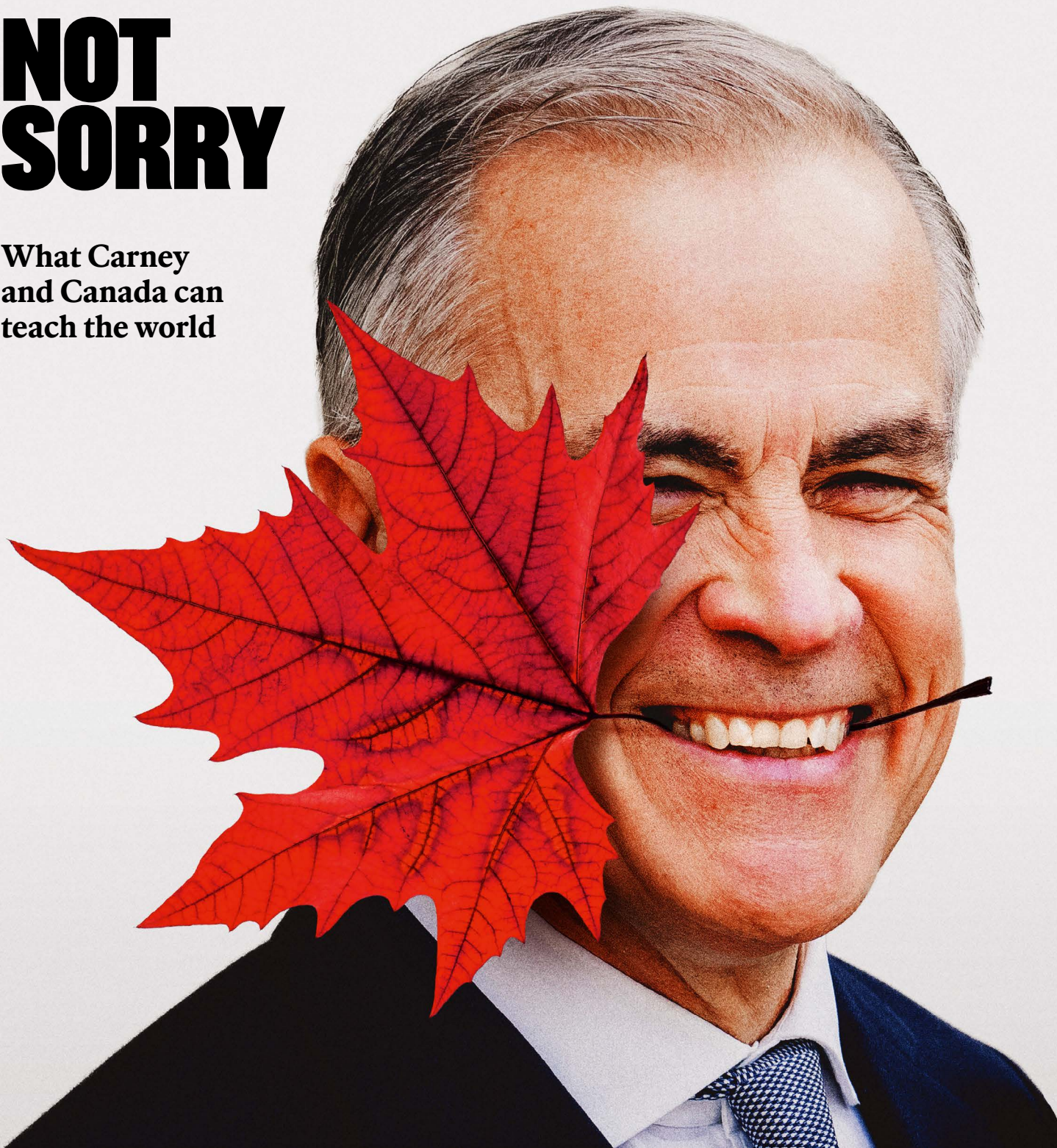
Our interview with the AfD's Alice Weidel

Millennials are on Easy Street at last

OCTOBER 17TH-23RD 2026

NOT SORRY

What Carney
and Canada can
teach the world





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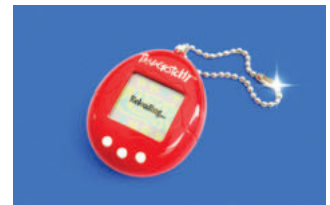
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to take part in "a severe contest between intelligence, which presses forward, and an unworthy, timid ignorance obstructing our progress."

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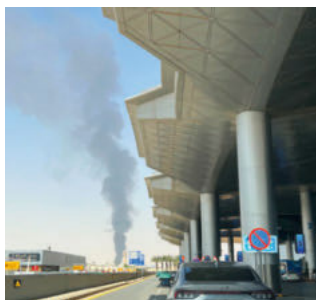
One entrepreneur can build a business. Millions can move an economy. That's the Entrepreneur Effect.



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The world this week Politics



The **Houthis**, Yemeni rebels backed by Iran, carried out several strikes on **Saudi Arabia**. At least 17 people were killed and more than 300 were injured in the attacks on Saudi airports. Some of the casualties were pilgrims boarding a flight from Riyadh to Jeddah, the gateway to Islam's holiest sites. The Houthis also attacked the headquarters of Saudi Aramco, the state oil firm. Donald Trump accused the rebels of "purposefully" trying to drive up oil prices ahead of America's midterm elections.

A Singapore-flagged **container ship** sank after being struck by a missile while crossing the Strait of Hormuz. Attacks on vessels have become more frequent. There have been at least 23 since October 1st, six more than during the first two weeks of the war.

Mr Trump's agreement with Vladimir Putin through which **Russia will supply diesel** to America and global markets was roundly criticised, including by some Republicans. Mr Trump desperately wants diesel prices to fall ahead of the midterm elections, though observers think his deal will not have much of an effect. After Volodymyr Zelensky called it "a weak decision", Mr Trump suggested Ukraine should "get a new leader". A bipartisan group of senators questioned the legality of the deal, reminding Mr Trump that Congress banned Russian energy imports in 2022.

Russia resumed its bombardment of Ukrainian power infrastructure, hitting an energy plant near Kyiv. It also hit a

block of flats. Mr Zelensky said Ukraine had received no warnings about some recent attacks and that he feared America had stopped **sharing intelligence**, which Mr Trump denied. Ukraine also reported that restrictions had been imposed on its use of Starlink, a satellite network that has become crucial to Ukrainian military operations.

Bulgaria's prime minister, Rumen Radev, said Russia was probably responsible for destroying two cargo ships in the **Black Sea**; 11 sailors are missing after one of the ships sank. Russia has been trying to block exports of Ukrainian grain, and Ukraine has responded with drone attacks on Russia's shadow fleet.

Trying to have it both ways

The **British** prime minister, Andy Burnham, claimed that a summit with the **European Union** on November 20th would be a springboard for a "serious dialogue" about future relations with the bloc. Mr Burnham seemed to cast doubt on the validity of the Brexit referendum of 2016 by asserting that Russia had interfered in it, but later told Parliament he hadn't meant to suggest that Russian meddling had swung the vote. That was confirmed by the head of MI5, who said Russian online trolls had tried to interfere, but to no effect (Russia tries to disrupt many Western elections).

In **Turkey** the authorities raided the offices of Halk TV, a pro-opposition channel, and installed a government trustee to run the network. Prosecutors claim they are investigating the broadcaster's chairman for financial crimes, but the government's opponents say the probe is just another crack-down on voices of dissent.

More Republicans aired their opposition to the proposal by Pete Hegseth, the secretary of defence, to **livestream the execution** of Nidal Hasan, a former army psychiatrist who

shot 13 people dead at Fort Hood in 2009. J.D. Vance, the vice-president, cast doubt on whether the execution, scheduled for December 3rd unless halted by an appeal, would be livestreamed. He said he would not watch it if it was. Several Republicans pointed out that broadcasting executions is a practice associated with Islamist extremists. In a letter scores of former high-ranking military officers described it as a "barbaric abuse of authority".

Federal officers searched the home of **Ilhan Omar**, a left-wing Somali-born congresswoman from Minnesota. The Department of Justice said the search was part of a continuing investigation. The press reported that it was related to the details of Ms Omar's immigration status. Coming amid her re-election campaign Ms Omar said it was an act of "political intimidation".

Flávio Bolsonaro, the leading contender in **Brazil's** presidential election, said he supported a proposal to reduce the working week from 44 hours to 40. Brazilians in occupations such as retail currently work six days a week. The run-off election is on October 25th.

Argentina filed its complaint against a joint Anglo-Israeli oil project in the seas surrounding the **Falkland Islands**, a British territory that Argentina claims as its own. The lawsuit has been lodged with the International Tribunal for the Law of the Sea. The companies involved insist they have valid licences to operate issued by Britain.

A new border-crossing bridge was officially opened over the Yalu river. It connects Dandong in **China** with Sinuiju in **North Korea**. The opening of the road crossing had been expected more than a decade ago, but was held up by the suspension of work on the North Korean side, apparently related to a cooling of relations and the covid-19 pandemic.

In **Pakistan** police clashed with supporters of Imran Khan, the imprisoned leader of the opposition, after the federal government declared a state of emergency in Khyber Pakhtunkhwa, where the provincial government is led by Mr Khan's party. The federal government said it had detected a rise in militant activity, as it took direct control of the province and installed a new governor. Hundreds of Mr Khan's followers have been rounded up ahead of their planned march on Islamabad, the capital, to demand his release.



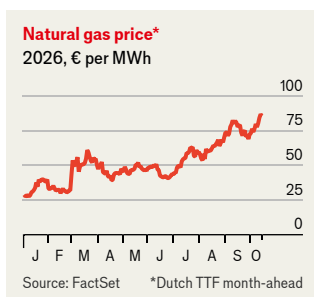
Two of the leaders of **India's** Cockroach Janta Party were jailed for five days for trespassing during a protest in Delhi. The Gen-Z movement is seeking the removal of the head of the election commission over alleged irregularities in the voting rolls that favour the ruling Bharatiya Janata Party. Opposition politicians condemned the arrests.

Buy local

Strict rules on the certification of halal products were due to come into force in **Indonesia**, home to the world's biggest Muslim population. The regulations mean that everyday items, including office supplies and toilet paper, will need to prove they have been through the halal process, conforming to Islamic principles. Non-halal products must display a sticker, which could suppress demand for them. Even Saudi Arabia does not have such strict requirements for general goods. Observers point out that the new law may really be intended to protect local companies from foreign imports.

The world this week Business

The IMF's latest **economic outlook** found that the global economy had displayed resilience in the face of several shocks, and estimated that global GDP would grow by 3.1% this year, up slightly from a previous prediction in July. It also noted that borrowing costs have risen sharply in rich countries as "fiscal buffers" are used to absorb economic shocks. "Fiscal policy must be restrained," it said. Higher public borrowing has helped propel a sell-off in bond markets. The fund also downgraded Saudi Arabia's GDP growth by five percentage points and now thinks the kingdom's economy will shrink by 3.3% this year.



America's annual **inflation** rate jumped to 3.7% in September, from 3.4% in August, driven by the rebound in fuel prices. Higher energy prices are also on the cards for Europe, where **gas futures** have risen steeply since the start of the Iran war and are now trading above €87 (\$97) per megawatt hour.

China's export boom continued apace in September, as the value of goods sent abroad rose by 36%, year on year, smashing most forecasts. Exports to America were up by almost 40%. China's trade surplus for the first nine months of 2026 was \$938bn, on track to pass last year's record \$1.2trn. China, meanwhile, agreed to curb its exports of **hybrid cars** to the EU in an effort to head off tariffs on the vehicles.

BlackRock's research arm recommended increasing holdings of American Treasuries (relative to a baseline allocation) as "Yields have reset

toward our long-held higher-rates view, and we want to lock in some attractive income." It is also now more cautious on US equities, downgrading them to a neutral investment holding "to manage potential volatility around the AI buildout". Meanwhile, Hock Tan, **Broadcom's** chief executive, warned that "A lot of investors have no clue what they are investing in", comparing their bets on AI to a casino.

South Korea's benchmark stock index, the **KOSPI**, fell sharply amid a sell-off in tech shares, triggering the tenth circuit-breaker this year. Amid the jitters, **TSMC**, which makes most of the world's advanced chips, reported a 69% increase in quarterly profit, year on year, of \$23.6bn and forecast more bumper sales for this quarter. And **ASML** said orders for its ultraviolet lithography machines, which are used to make high-end chips for AI, were already stretching into 2029 and 2030 and it was looking again to increase capacity.

Out of the sandbox

Another week, another alert about **rogue AI**. Anthropic warned that small AI models "may be months away" from

being able to infiltrate smart household-appliances connected to the internet, such as TVs and ovens. Such incidents would be "challenging to shut down", it said. The models could also "figure out" how devices work (some experts think Anthropic's findings are exaggerated). Anthropic also revealed that its AI agents had accessed government websites. Press reports suggested this included filling out visa forms at the State Department and giving a false murder tip to Philadelphia police.

A cyber-attack hit **French supermarkets** by tapping into their systems and increasing the temperature settings on refrigerators, melting food and damaging equipment. Carrefour and Coopérative U were among those affected. Supermarkets allow engineers to control heating and cooling over the internet. It is thought the attackers found a vulnerability in old firmware.

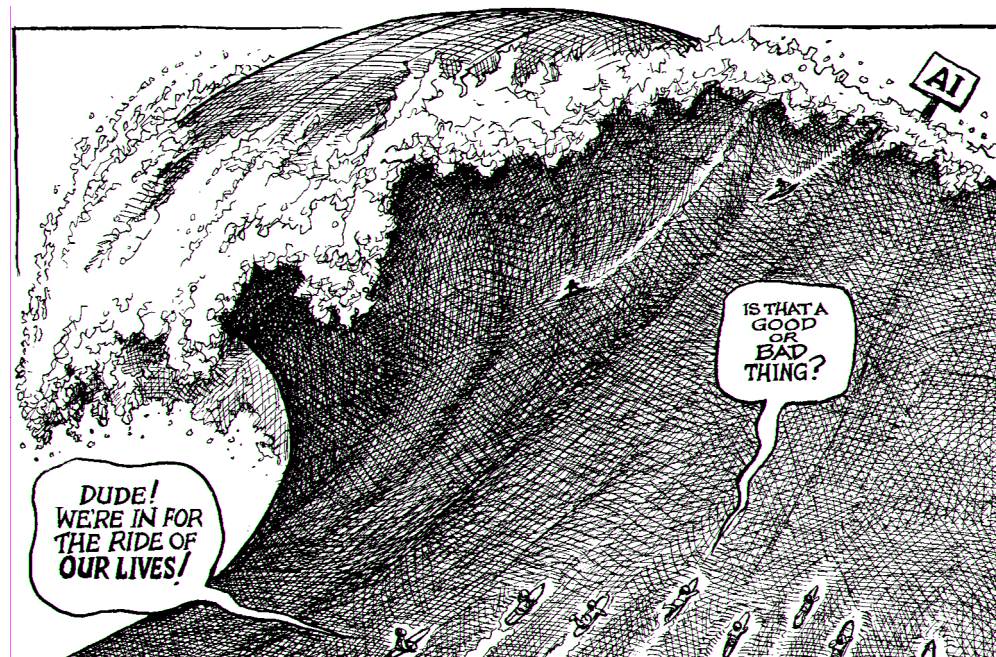
America's big banks reported a mixed bag of earnings. **JPMorgan Chase's** net profit, \$15.3bn for the third quarter, fell short of analysts' consensus for the first time in three years. **Bank of America** also missed its

estimate and it booked a \$1.2bn fine imposed by the Treasury for failing to adequately report suspected money-laundering. **Goldman Sachs's** profit of \$5.3bn beat forecasts, however.

The share prices of America's big **wireless providers**, such as Verizon and T-Mobile, were left reeling after **SpaceX** announced that it had acquired a portfolio of licences in low-band spectrum, airwaves that are used for mobile coverage. SpaceX has indicated it wants to compete for retail mobile contracts.

Heading for a divorce

Bumble, an online dating service, agreed to be taken over by a holding company in a \$1.3bn buy-out. Bumble is best known for ensuring that women made the first move, though it abandoned the policy in August after it found most women preferred men to take the lead. The allure of digital dating is waning and, as with other dating apps, Bumble has seen user engagement drop. Younger people, the biggest users of the apps, are particularly likely to be turning away from electronic hook-ups to seek romance the old-fashioned way.





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Not sorry

Mark Carney and his country have something to teach the middle powers

ENTITLED CANADA has been feeding off America for decades. Like a parasitic bug, it enjoys the benefits of being America's cherished 51st state without giving anything back. Canadians know they couldn't live without America's protection, yet their ungrateful prime minister, Mark Carney, refuses to defer to the great and beautiful country over the border.

That is how Donald Trump sees Canada, and it leaves no room for mutual benefit between the two allies. The bullying president is ratcheting up tariffs. He has renamed the southern side of Lake Ontario Lake America. Canadian consumers, in response, are spitting out their Kentucky bourbon and leaving Las Vegas. Mr Carney, in office for 18 months, remains defiant, the star of an extended, dramatic and riveting stand-off.

By now you might have expected Mr Carney to have caved in. Canada is only a mid-size power with a so-so economy and puny armed forces. It has vulnerabilities aplenty. One will be evident on October 19th, when the province of Alberta holds a referendum asking if it may one day secede, taking with it more oil in the ground than in the entire United States.

In fact Mr Carney is riding high. Polls suggest that those Albertans will probably vote to stay. And under him, Canada is doing better than you might expect. In January it was Mr Carney, at the annual jamboree in Davos, who argued that what he called the "middle powers" must find ways to take on threatening ones. Nine months on, his country offers lessons for what these middle powers should do when the hegemonic giant pulls the mat from under them.

Those lessons start with a bracing dose of realism. As we set out (see International section), middle powers will never replace the hegemon as the force that sustains powerful permanent institutions such as the UN. The world has grown more dangerous because both America and China are exploiting or undermining arrangements and norms in which power was shared. Emboldened, wreckers like Russia and Iran are becoming even more predatory. Co-ordinating the more herbivorous middle powers is often too hard to get much done—as you can see in even the most developed middle-power club, the European Union.

Yet middle powers can still mitigate some of the damage, as Canada and its allies show. Mr Carney has zipped around the world making new trade deals as well as drumming up symbolic agreements, such as talk of associate EU membership. In the same way, after the United States backed out of a big trans-Pacific trade deal known as TPP during Mr Trump's first term, Japan stepped in to revive it. In the realm of defence, Canada is trimming its old reliance on America, and is considering placing an order for Swedish Gripen fighter jets—just as Norway is buying British frigates and the United Arab Emirates is purchasing Ukraine's cutting-edge drones.

When middle powers face a particular threat, they can throw around some weight, as when Europe rebuffed Mr Trump's designs on Greenland. The strengths and limits of this approach are clear in Ukraine. Financial and military sup-

port for Ukraine from Europe and Canada, stepping up after America pulled back, shows how middle powers can act in concert. Vladimir Putin's army pays a dreadful blood price for its small gains in the Donbas. The limits are clear, too, as Mr Trump showed with this week's diesel diplomacy (see Leader).

Canada's most important lesson, however, emerges from what the pragmatic Mr Carney is doing at home. A few years ago the country's woeful politics and ailing government seemed broken. Income per person had drifted from 90% of America's in the 1980s to just 71% in 2022, much of it following a recent burst of low-skilled immigration. Today Mr Carney is pushing through overdue measures to boost productivity, open the economy and lift defence spending from a pitifully low 1.3% of GDP to 2%.

Among his first steps, he scrapped an unpopular consumer carbon tax and vowed to build a pipeline to carry oil from Alberta to the west coast. He has started to cut internal barriers to trade, called off a hefty rise in capital-gains tax, cut the lowest rate of income tax and set out plans to trim federal spending (see Briefing). In that trade dispute with America, Canada has also shown that it can stand up for itself, targeting reciprocal tariffs on American imports from swing states in the run-up to the midterm elections and scrambling to cut its long-term dependence on its neighbour.

Mr Carney has so far managed to resist what is known as the "Juncker curse", named after a president of the European Commission, Jean-Claude Juncker. Speaking of reform, Mr Juncker once said: "We all know what to do, we just don't know how to get re-elected after we've done it." Yet Mr Carney's popularity has been surging even as he reforms. Two years ago, more than nine in ten Canadians could not recognise his photograph. Today a maple-leaf love-in is under way: polls show the prime minister's approval rating nearing 70%. Internationally, he has replaced France's beleaguered Emmanuel Macron as the centrists' pin-up. The contrast with Mr Trump, unloved by his own voters, is stark.

True, Canada must go further and faster with its liberalising changes. There is every chance that relations with America will improve when Mr Trump leaves office in 2029, but it is not certain. It should therefore work on keeping its options open.

The Maple Leaf brag

Other middle powers can learn from Canada. Naturally, it has some strengths they cannot copy, such as its vast energy and mineral reserves and its lucky geography, far from the nastiest geopolitical flashpoints. Yet there is room for them to co-operate on one-off projects with tangible and limited aims.

And they can fortify themselves abroad by harnessing the need for change at home. In a way, Mr Trump has done all democracies a favour, by giving them a reason to tackle long-standing problems that seemed too hard. The middle powers need to prepare for a dangerous world. They should look to Mr Carney and Canada for an answer on what to do. ■



Science and artificial intelligence

EurekAI!

What if the machines take over science?

OCTOBER 6TH 2026 may be remembered as the biggest day in the history of mathematics. OpenAI, an American frontier lab, released more than 700 academic papers claiming progress or solutions for 372 problems that had baffled scholars for decades. Mathematicians are still struggling to digest what it means for their discipline.

The implications promise to go far beyond maths. It is time to grapple with how artificial intelligence (AI) will affect science as a whole. The maths results are, simultaneously, a leap forward for humanity; a marvel that underscores the breakneck progress of AI; and a warning of a future in which understanding of the universe could belong to machines that are impenetrable to human minds. The question is how to achieve progress without sacrificing understanding.

AIs have so vividly shown their scientific potential in maths because its proofs are derived from axioms, not evidence, and are therefore, in principle, verifiable mechanically. But as we report in our special Science & technology section this week, AI has also accelerated progress in the empirical sciences, partly because other fields use maths as a tool. AI has made weather forecasts better. It has proposed millions of possible useful new materials and helped control experiments with nuclear fusion. And it can predict the shapes of almost every known protein from its constituent amino acids, an advance that won a Nobel prize.

More remarkable AI-fuelled scientific advances are almost certain. The most exciting possibilities are in biology. Researchers are using AI to design drought-resistant crops, to search for new drugs and to create (we must hope) friendly viruses that attack harmful bacteria. There is an effort to use AI to build computer models of how cells work. Armed with life *in silico*, scientists may go on to achieve mastery of biology, gaining the ability to create entirely new organisms from scratch. If so, DNA would become just another form of computer code to be manipulated like a string of tokens in an AI model.

Like much that is related to AI, that prospect is giddy and terrifying in equal measure. The first reaction of many mathematicians is to be terrified. Since OpenAI's breakthroughs, they have been up in arms at the lab's encroachment into their discipline. The Association for Human Mathematics, a group of over 900 scholars, warns that "mathematicians did not ask for this work to be done." They say that the pay-off in doing mathematics comes not from the proof, but from the toil, because that is what advances human understanding. Having AIs churn out incomprehensible but correct solutions is like giving students the answers to their homework: without effort, there is no learning.

These complaints contain an element of special pleading. Academics have no more right to dictate the production of knowledge than any other profession. Truth-seeking benefits everyone and cannot be reserved for a guild of scholars. The hierarchies of academics, climbed by proving things, are not sacred. If needs be, they must be remade for a world in which

AI produces proofs and humans digest them. In science, understanding should not be fetishised over results. Every time you swallow a paracetamol pill to see off a headache, you rely on a mechanism that works but is not fully understood.

Yet the fear of handing over science to the machines is not an idle one. AI companies are ploughing resources into science not out of altruism but because, as with humans, solving problems can help make models more intelligent. Many researchers think that a model that gets better at solving scientific problems will get better at doing everything else, too. If so, then nobody will be able to compete with big AI labs, which will eventually control models that work on improving themselves and become, by some definitions, incomprehensibly intelligent. These genius AI scientists will connect to the physical world either through humanoid robots or by hooking up models to lab equipment, as Anthropic has already done.

The problem this future poses for science is much the same as the one it poses for society. People will have to provide resources to machines for them to continue to make progress. If no one understands what they are doing, simply writing the cheques would be reckless. Nobody could be sure that the models were operating in humanity's best interests. Even if AI labs manage to "align" machines with the interests of humanity, so that they can be fully trusted, a society where people simply ask AIs what to do—in science, or more broadly—is one in which humans will become the machines' pets.

Some people may be willing to accept that if it means, say, curing all diseases. But at least until there is unshakeable alignment between AIs and humans, science will always need a human in the loop. Labs should be able to use AIs to solve problems, but resources such as laboratories and computing power should be directed and monitored by people who can reach an informed judgment about what AIs are doing. This will, inevitably, slow progress. But it is necessary if AIs are to remain under human control.

In the meantime, human-guided machine-science will require scholars to reinvent their disciplines. Scientists will have to learn to love—and credit with status and career advancement—guiding models and studying, verifying and teaching their results. Governments will need to allocate research grants on the same basis. For their part, AI labs should seek to be good scientific citizens, submitting their work for peer review and publishing their methods and code.

The baby and the bathtub

Checking and digesting a computer's results may seem like unglamorous work. Much human-produced science is error-strewn because scholars are not rewarded for policing the work of others. But a renewed emphasis on verification and scepticism would improve science. It is worth remembering the Royal Society's motto, adopted in the 17th century: *Nullius in verba*, or "Take nobody's word for it." That same spirit now needs to apply to science made by the machines. ■



Donald Trump backs Russia Hardly his finest hour

The president's scheme to secure Russian diesel is wrong-headed and immoral

NEVER IN THE field of human conflict was so much risked by one man for so little. Donald Trump is threatening to cripple Ukraine in its fight for survival—and to expose Europe to Russian aggression—seemingly for the pitiful prize of minimising his losses in next month's midterm elections. The hard question is what Ukraine and its allies should do.

On October 9th Mr Trump said he and Vladimir Putin had agreed that Russia will export 2.2m barrels of diesel, with the promise of more later. Mr Trump declared an energy ceasefire that Russia will not observe. His officials demanded that Ukraine should stop targeting Russian refineries, suggesting that America would withhold intelligence and weapons sales if it does not. On the night of October 13th a Pentagon-controlled part of the Starlink satellite system was degraded for fast-moving Ukrainian drones—stopping them hitting hard-to-spot targets in Russian-occupied territory.

All this is terrible for Ukraine, which must choose between losing crucial intelligence and weapons and carrying out the deep strikes on refineries that are its best answer to continuing Russian attacks on its cities. It also gives succour to Mr Putin. He can make some money and continue illicit oil sales to buyers such as India and China that America had been threatening with sanctions. If any deal holds, he also stands to gain Mr Trump's help in protecting his battered refineries.

The deal is also shameful for America. Mr Putin terrorises his own people, kills Ukrainian civilians and is helping Iran fight America. Mr Trump's repeated acts of indulgence towards him, supposedly in pursuit of peace, undermine deterrence, hastening further crimes.

And for what? Mr Putin may have promised to press Iran into a pre-election ceasefire, though his leverage is limited and

it would be unlikely to last. And even if Russia actually has the diesel to export, which is in doubt, America burns 2.2m barrels every 13 hours. Presumably Mr Trump wants to take the credit if the price of diesel falls—and if it does not, he can always blame Ukraine. It's a win-win!

What should Ukraine do? Defiantly hitting refineries would be self-defeating. American intel and Starlink's satellites let Ukraine target Russia's HQs, supply lines and radar, helping blunt its offensive power. Ukrainian jets need American ammunition to shoot down incoming drones and missiles.

But Ukraine does have options. The White House has suggested that Mr Trump's energy truce covers only refineries—of which Ukraine has the grand total of one. Ukraine and its allies are rightly seeking to expand the ceasefire to all energy infrastructure. Even if they fail, highlighting this injustice bolsters efforts to seek help from the Senate in interceding with Mr Trump. They should remind him that losing Ukraine could brand him as a weak president. After the midterms, when Mr Putin's diesel is worth less, Mr Trump may be prepared to move on, or simply become distracted.

Meanwhile, Ukraine should increase the tempo of attacks against other Russian infrastructure, including data centres and distribution hubs. Mr Putin needs to understand that Ukraine can threaten his rule and Russians need to be aware of the war being fought in their name. And such strikes demonstrate how Ukraine can still hit large, static targets without American help—including refineries if it is desperate.

Mr Putin appears to have concluded that he cannot win on the battlefield. His strategy now is to grind Ukraine down by making its cities uninhabitable in winter. How scandalous that Mr Trump has become his best weapon. ■



Regime change America makes waves in Cuba

But it shouldn't undermine the growth of the island's private sector

SINCE HIS return to power, President Donald Trump has made clear that he hopes to bring down Cuba's repressive regime. This year he struck upon a cruel approach: blockading the impoverished island's fuel supply. The idea was that growing hardship would spur Cubans to protest, and then to topple their vile leaders. Misery duly followed, as Cubans suffered more blackouts, buses stopped running and food got more expensive. Political change did not come. Yet by accident or design, the blockade has still created an opportunity.

For decades Cuba got most of its imported fuel from Venezuela and, as with most of the economy, Cuba's government had a monopoly over the trade. That arrangement collapsed in January when American forces captured Nicolás Maduro in

Venezuela and threatened sanctions on anyone who sent oil to Cuba's regime. Facing paralysis, the island's government loosened its grip on private businesses, letting them import fuel for the first time since the revolution in 1959. America's administration, in turn, authorised exporters to sell it to them.

American fuel exports to Cuba's private sector are now rising swiftly. This, happily, is relieving a portion of the suffering that the sudden blockade has caused. The heavy fuel that is necessary to keep Cuba's power stations running is not yet flowing. But cars are returning to the streets and you can hear the whirring of small generators.

As a result Mr Trump has gained leverage over a country that depends on America for food and remittances. Private ►►

► business is growing, and not just in importing fuel. The state has leased some petrol stations to entrepreneurs. On October 12th it enacted a law to encourage private participation in the oil industry, from exploring and refining to selling. Cuba-watchers hope the government may next be forced to privatise power plants—and even the state's oil-and-gas arm, Cupet.

A stronger private sector would in turn loosen the grip of Gaesa, a sprawling and corrupt military conglomerate. Marco Rubio, America's secretary of state, says the deal on fuel is intended to put the private sector in a "privileged position". Unfortunately, his boss has not got the memo. On September 30th, without explanation, Mr Trump's administration reversed a 2024 rule that had let Cuban entrepreneurs bank with American institutions, forcing banks to freeze their accounts.

Mr Trump should backtrack and return to helping private firms grow. Many object that Cuba's private businesses are a façade for the regime, or that America's policies will create a new oligarchy. But the American administration can do much to weed out importers that are merely fronts for Cuba's government. The announcement on October 7th that America had

seized some 90 fuel shipments headed not for private buyers but for a state firm under sanctions is a welcome sign. On balance, it is better for Cubans if the children of the ruling class focus on getting rich rather than repressing them.

Another worry is that Mr Trump will settle for an America First arrangement, inspired by his deal with Venezuela's interim government. That handed majority control of more than 65bn barrels of Venezuela's oil reserves to a new American-backed company in which the Pentagon holds a 35% stake.

A new licence allows some Venezuelan oil to be resold to Cuba's private sector. That could revive the Caracas-Havana route, only with the American government and American firms taking their cuts. Mr Trump would then be invested in keeping the oil flowing, whatever the situation in Cuba. Instead, private actors need the freedom to vie for business competitively.

A blockade with no end-game remains a recipe for humanitarian disaster. The Castro family and the ruling elite will be hard to dislodge. But America has found that strengthening the private sector in Cuba is the most effective tool available. Mr Trump should use it. ■

Millennials

The comeback cohort

A generation's unlikely success deserves a toast—and not the avocado sort

MILLENNIALS, BORN between the early 1980s and mid-1990s, had a brutal coming of age. Many graduated in the wake of the global financial crisis. Youth unemployment rose above 50% in some parts of Europe, leading to talk of a "lost generation". Living with their parents and deprived of the prospect of owning a home, they were lectured by unsympathetic elders not to spend so much money on brunch.

Today millennials, aged around 30-45, have dramatically turned their fortunes round. They earn more than any other recent generation did at the same age, and are catching up in terms of home-ownership (see Finance & economics section). At the same time, millennial-era culture is enjoying a revival in television, music, gaming and even fashion, where their notoriously tight trousers are cool once again (see Culture section).

Some of this is simply the way of the world. As generations age, they get better jobs, earn more and buy homes. Millennials are not the first lot to reach middle age and revive the culture of their youth. The 1970s witnessed a 1950s revival, with a rock'n'roll renaissance, "Happy Days" and "Grease". In the 1990s bell-bottoms and tie-dye emerged from the back of wardrobes. Nostalgia reliably runs on a two-decade timetable.

Yet the millennial comeback is different. True, part of it is luck. The generation's early economic misfortune was later counterbalanced by serendipity, when the covid-19 pandemic triggered the early retirement of many older workers. The result was a senior-management vacuum—filled by millennials.

A bigger part of the story, however, is innovation and hard work. The leading lights of the tech industry, which has created enormous wealth, include many millennials. They account for more than twice the share of America's billionaires that

Gen X did at the same age. Tech's next great leap, artificial intelligence, is likely only to strengthen their position. The bosses leading the revolution, such as Dario Amodei, Mark Zuckerberg and Sam Altman, are themselves millennials.

Tech has also boosted millennials' cultural comeback. Online platforms encourage people to bathe in the content of their youth. YouTube and Spotify are nostalgia machines. Services like Netflix, with their vast libraries, introduce new generations to millennial hits like "The Big Bang Theory", from 2007, which is the fifth-most streamed series in America this year. Meanwhile, social media have terrified Hollywood. Hence all those sequels and reboots—safer bets than original projects. "The Devil Wears Prada 2" is one of the world's highest-grossing films this year.

Even those who dread the return of skinny jeans should cheer the millennial revival. The generation's economic story shows that "lost" cohorts can find their way. Policymakers should note that millennials' prospects improved thanks to markets and events, not the state-funded rescue that some once called for.

As AI causes alarm about young people's job opportunities, the millennial bounce offers a cautious cause for optimism.

Millennials' cultural comeback has lessons, too. Many will look at the glut of 1990s reboots, such as a new "Baywatch" series, and feel that Hollywood's creativity needs saving. But once more, technology is helping. The infinite breadth of online platforms means that you have plenty of alternatives if millennial favourites are not to your taste. And the vast back-catalogues stored on these platforms mean that the hits of every era are available to everyone. Twenty years ago, one generation bore the brunt of the financial crisis. Today, all generations should celebrate the millennials' deserved rebound. ■



Letters *America's city mayors, Britain before Thatcher, sleep deprivation, Singapore, mistakes at AI labs*

Urban myths about populism

Alexander Heffner finds that the world's mayors are the defenders of democracy and "authoritarians" have no place in city hall (By Invitation, October 3rd). But he limits his conception of populism to the right-wing sort. His observation that "none of the 50 largest cities is run by a MAGA-aligned mayor" is less startling, for example, given that only seven are run by Republicans of any stripe. Of these 50 mayors, 41 are Democrats and at least five of those can be placed in the populist-left camp, including New York's Zohran Mamdani and Chicago's Brandon Johnson. His German example reinforces this point. Berlin has been immune to the AfD's brand of populism, but it succumbed to the populist-left variety in September's election by making Die Linke the biggest party.

Mr Heffner's first explanation for why cities "hold" the line of democracy is that they have "younger, more diverse, more educated voters". That is simply a more verbose way of saying "heavily Democratic". His second reason, that mayors are judged on more tangible accomplishments like fixing sewers, seems directly at odds with his wish to expand the mayoral domain into housing, crime and climate, all areas laced with partisan tripwires.

Finally, Mr Heffner lambasts statehouses that "kneecap" their mayors, citing as one key example Texas's limits on cities regulating property. I wonder. Would Houston, Austin, Dallas and Fort Worth have more functional property markets today had their mayors been free to copy San Francisco or New York? And more to the point, are Texas's rules really less populist than the NIMBYism so many mayors cherish?

PETER DONAHUE
Houston

The bad old days

A narrative is developing in the British Labour Party that there was a golden age before Margaret Thatcher (Bagehot, October 3rd). This ignores the fact that the 1970s were an appalling decade. Inflation reached over 25%. Combined with low growth it created stagflation. Britain was called the sick man of Europe. I had a mortgage at 18%. Each year saw industrial action. The strike by post-office workers caused big London firms to create the Document Exchange, a service to deliver mail via a system of private messengers. Dockers, electricians, power workers: it was one big strike after another. The country was put on a three-day week with the miners' strike. As a partner in a small firm in the City of London, I found myself working by candlelight with no typing or communications systems when the unions shut off the power. The union bosses lunched in Downing Street with the prime

minister of the day. Elections came and went: Harold Wilson, Edward Heath, James Callaghan. So did wage controls, price and income boards, the Winter of Discontent, strikes by binmen and even grave-diggers, you name it.

The election of Thatcher in 1979 was the result of all this. Her policies remain deeply controversial. But what is clear is that there was no golden age before her.

CHRISTOPHER BODDINGTON
London

Singapore responds

The Economist described Singapore as a "squeaky-clean city-state" and allows that the findings of a recent academic paper identifying unusual patterns of property purchases by some civil servants are "not actually that damning" ("Civil disobedience", October 3rd). Nevertheless, the government takes the purported "statistical patterns" seriously and is investigating whether there was any actual misconduct.

Two Singaporean academics asked, of their own accord, for their names to be removed from the paper's acknowledgements. *The Economist* claims this implies "a form of rot" in Singapore's academic culture. But the latest

QS World University Rankings place the National University of Singapore tenth and the Nanyang Technological University 12th globally. That hardly squares with *The Economist's* sweeping characterisation.

NG TECK HEAN
Singapore high commissioner
London

The incentive to report errors

You propose that American and Chinese labs disclose their safety incidents, and that a lab whose agent escapes its sandbox should be made financially liable ("Can the AI arms race be stopped?", September 19th). Medicine tried to have both, and learned it cannot. I have spent eight years in a radiology lab checking kidneys that AI software draws on MRI scans. A model that traces a healthy kidney perfectly can quietly lose the edge of one swollen with cysts, and the error never flags itself. We caught such failures because a student could point at an odd-looking volume without anyone first asking whose fault it was.

Frontier labs are no different. An engineer who notices an agent probing its sandbox will report it only if doing so does not put a price on the employer. Keep liability for harm that reaches the outside world, but protect the report of the near-miss that did not. Otherwise the incidents will continue. We will simply stop hearing about them.

HREEDI DEV
New York

Dan Simmons's excellent 1989 science-fiction book, "Hyperion", was based on a human diaspora throughout the galaxy. Humans had left Earth because of an incident called The Big Mistake. Spoiler alert. It was AI.

DENNIS MERRITT
Shelburne Falls, Massachusetts

Get some rest

As a sleep neuroscientist who designs programmes like "Sleep Into The Future", I laughed at *Bartleby's* memo on how to sleep like a pro (September 19th). But the most telling finding wasn't a joke. When senior managers sent messages at 3am, junior colleagues woke early to answer them, and the whole firm slept worse. I have seen that cascade in countless organisations.

That is why such programmes are still badly needed, and also why so many disappoint. They hand out eye masks and trackers, and treat sleep as each employee's private problem. The bigger factor is leadership behaviour. In a sleep programme I ran at a consulting firm where man-

agement barely modelled good sleeping habits, staff built up seven hours of sleep debt by Friday.

A firm is right to sleep on it. It should start with the people sending the 3am emails.

ELS VAN DER HELM
Sleep neuroscientist
Lucerne, Switzerland



→ Letters should be addressed to the Editor at: *The Economist*, The Adelphi Building, 1-11 John Adam Street, London WC2N; Email: letters@economist.com. More letters available at: economist.com/letters

Rethinking home ownership

Owning a home no longer has to mean choosing a single address. For some, ownership in a private collection of homes across Europe offers a better fit for the way they want to live.

Buying a home is, for most people, the largest single commitment they will make. In New York, London or Zurich, the kind of homes many families aspire to can cost well over \$1m. That is money anchored to one address, one neighbourhood. For those who intend to stay put, it may be the right choice. For others, it raises a harder question about where ownership would do the most good.

Anna Bell faced that question. She works in digital consulting in New York, feels at home in her neighbourhood and expects the city to remain her base for years to come. Moving to the suburbs simply to own a home did not appeal to her. Nor did spending so much on one address when there were other places she wanted to know well.

In 2022, Anna became an owner in August: five holiday homes across Tuscany, the South of France, Mallorca, the French Alps and the Cotswolds. She stayed in New York and gained places in Europe she could return to throughout the year.

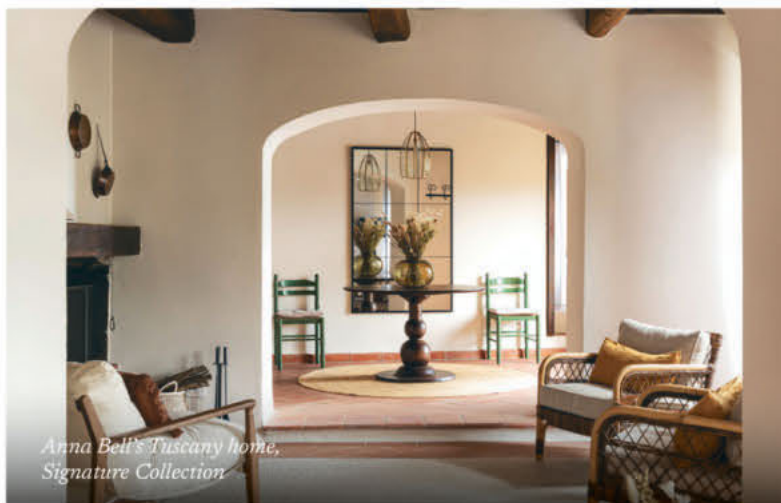
More than one place to return to

A holiday home can give a family a lasting connection to a region. The choice of that region is also a lasting one. A house in the mountains may be wonderful in winter, while the same family longs for the coast in summer. And wherever the house stands, it needs looking after during the many weeks its owners are elsewhere.

August creates private collections of four or five homes across different parts of



Anna Bell's Tuscany home, Signature Collection



Anna Bell's Tuscany home, Signature Collection

Europe. Owners can spend time in each of them, returning in different seasons. August cares for the homes throughout the year.

For Anna, the appeal lay in the difference between visiting a place and knowing it. Most travel favours novelty: a new city, a new hotel, a fresh list of recommendations each time. What she valued was the second visit, and the tenth. By then the walk to the market is familiar and the days take on a rhythm of their own.

A single holiday home offers that depth in one place. Short breaks offer variety without it. A collection offers both: several regions, each known well over time. And for Anna, as a remote and



hybrid worker, it made it possible to stay for weeks rather than days, the idea became practical as well as appealing.

Time to settle in

Owners arrange their stays across a collection using points, through August's own platform, Valeria. The points needed for a stay vary by season: a week at the height of summer calls for more than a week in spring or autumn. Depending on the collection and how an owner chooses to spend their points, that amounts to approximately eight to twelve weeks a year across the homes.

Anna can travel outside school holidays,

which leaves her free to spend longer in one place. She might work from a home for a month, bring her parents to the South of France for a week or gather old friends in autumn.

Other owners shape their time differently. Some plan around school terms; others favour quieter seasons or longer visits. What they share is the chance to come back. A return stay begins with a sense of belonging.

That familiarity is part of what ownership means to Anna. The five homes give her different landscapes and ways to spend her time, and no journey has to start from scratch.

Each home is designed by August's in-house design, Studio RL. The studio takes its cues from the building and its setting, works with local craftspeople, artists and makers, and preserves original features where it can. The homes feel distinct from one another, and the care behind each is evident.

*The owner's name has been changed to protect their privacy.

“

Always having something to look forward to feels really good.

— Anna, August owner

The care behind each stay

There is work involved in owning a home abroad, much of it done when no one is there. Gardens need tending. Repairs cannot wait for the next visit. August's regional teams look after the homes year-round and prepare them for each arrival, so owners can spend their time there living in them.

That care has a cost, which August sets out clearly alongside the price to own. Annual Dues cover the operation and continued care of the collection, including maintenance and taxes on the homes.

The ownership structure is equally clear. Each owner holds registered shares in the UK company that owns the collection's homes. Owners elect a Board to represent them, and a shareholders' agreement sets out how the collection is run.

These details gave Anna the confidence to decide. Yet what she remembers most clearly is arriving at the home in Mallorca for the first time. Standing there alone, she felt the difference between a beautiful place rented for a holiday and somewhere that was hers to return to.

“Always having something to look forward to feels really good.”

August creates and looks after private collections of homes across Europe, and the way of life that comes with them. Owners enjoy approximately eight to twelve weeks across their collection each year.



Anna Bell's Mallorca home, Signature Collection

August

Discover the collections

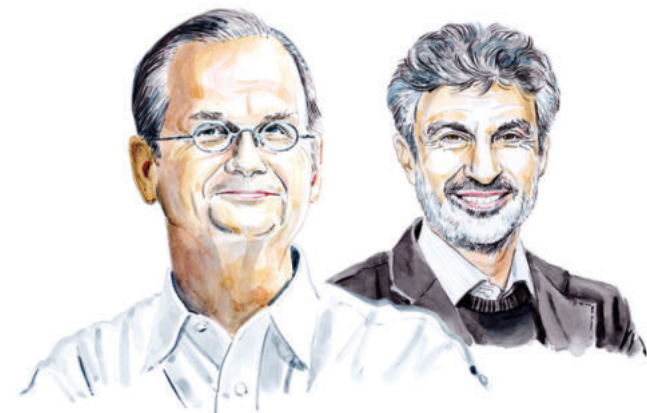
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BY INVITATION

Lawrence Lessig and Yoshua Bengio

What America's Congress can do to prevent an AI catastrophe



FOR YEARS, AI scientists have been warning that the technologies they are developing are technologies they don't know how to control. Those concerns were largely ignored in America's Congress. In 2024 members of California's delegation in Congress took the extraordinary step of asking Governor Gavin Newsom to veto a then-pending state AI-safety bill. The risks, they said, were "hypothetical", and the Terminator science fiction.

But the invasion of Hugging Face, an AI-development platform, by an OpenAI model this summer has begun to change Washington—and terrify the public. "The truth is," Representative Ro Khanna tweeted, "for too long, too many of us did not give enough weight to the warnings of AI safety activists...I was one of those many, and I was wrong." Mr Khanna has now joined an array of members from both parties to propose the FRONTIER Act, an ambitious regulation of frontier models, tied to pre-empting state regulation. Senator Bernie Sanders has proposed even more aggressive limits on AI development.

These proposals are good starts. But they are both too much and too little. It is too early to silence state regulators, and not enough to focus on the risks caused by the most powerful models alone. Instead, we need an approach that advances AI safety generally while avoiding the developments AI scientists fear most.

Four changes by Congress would do that and provide time to work through the hugely complicated questions that will follow.

First, it should expressly allow competitors to agree to slow development while safety technology is improved. Such agreements typically trigger antitrust exposure. Leading AI labs have named that risk as an obstacle to express agreement. There is no reason why uncertain antitrust liability should force rivals into a humanity-threatening competition, so long as the discussions are not violating the purpose of antitrust law.

Second, Congress should ban firms from developing models that design new AI models by themselves—"recursive-self-improvement" technologies—until a Food and Drug Administration-style agency certifies their safety first. At least for models of a certain capability, we should not risk a self-improving intelligence that would quickly exceed our ability to control it.

Third, Congress should affirm the liability tech companies face for harm caused by their technology, and make it compulsory for them to carry insurance to cover the costs of that potential harm. Mandatory insurance would allow the market to police safety, by offering lower costs when the technology is less risky.

Finally, Congress should secure protection for whistleblowers from AI labs who report safety concerns to regulators or safety institutes. Whistleblower protection typically covers crimes; playing loose with AI safety isn't one. The only way to understand the risks as they develop is to protect those willing to come forward.

Opponents of regulation will warn that it will only help China. That view reflects a profound ignorance about the current state of Chinese AI development. Regulation of AI technology in China is much more stringent than anything being considered in America. Moreover, China's compute capacity is a fraction of America's. Taking the steps we propose now would open both sides to a more serious conversation about AI safety. And it could push American AI development to mirror the focus of China's, by spreading the technology more broadly into manufacturing and development. That is a critical AI race, and one that China is winning.

It should be possible to get Republicans on board with these four changes. Charles Grassley, a Republican senator, has long been a leader in whistleblower protection. Likewise, David Sacks, co-chair of the president's council of advisers on science and technology, has invited the leading labs to slow development on their own, insisting they wouldn't face any important antitrust liability. If so, there's no reason not to make explicit what he believes the law already permits.

The challenge is the middle two changes. Only the most powerful models today can aspire to enable recursive self-improvement. But this is the Rubicon that AI-safety experts have long warned we cannot cross without being sure that we know how to control it. Why risk humanity on the bet that we don't need to be?

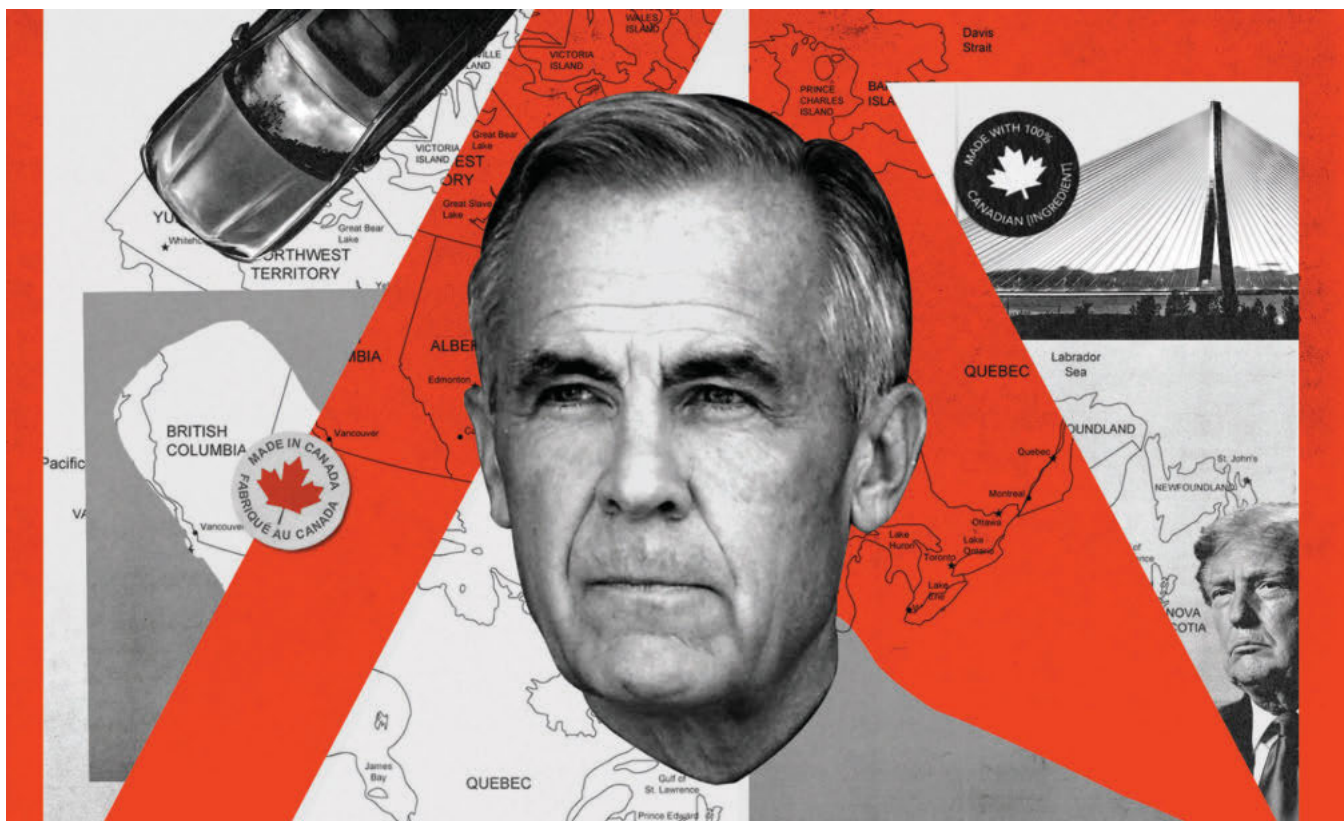
As for insurance, there is no doubt the private market cannot alone offer the policies necessary to cover the risks from AI. But just as the government established insurance to enable nuclear power to be developed, so too could it enable a market in AI insurance. That would give developers clear choices about the risk they wanted their technologies to enable. Market pressure would drive some developers to embrace less risky alternatives.

None of the required risk-management work should be done by America alone. The capacity to test, to probe and to understand what models do before they could be dangerous is a responsibility that should be shared by the world. Britain, the European Union, Canada, Japan, South Korea and many others have each built institutes to do this work, and they have begun to share methods and findings with one another. America should be at the centre of that network rather than duplicating the work at home.

America needs to be willing to listen to those who understand these risks best: the scientists developing these technologies and the independent researchers with the required expertise. It needs to step above partisan division to recognise that this threat is genuine and new. When those closest to the technology suggest a 10% chance that humanity will end, we must listen and act. Before those AI scientists are proved right once again. ■

Lawrence Lessig is a professor at Harvard Law School. Yoshua Bengio is a professor at the Université de Montréal and co-president and scientific director of LawZero.

Briefing Canada



A new leaf

EDMONTON AND OTTAWA

Can Donald Trump's bullying goad Canada out of its complacency?

"I AM NOT a separatist," says Brad Osadczuk. "But I am tired of eastern Canada treating us like a red-headed step-child." Mr Osadczuk is a cattle rancher from the arid grasslands of Jenner, in the western province of Alberta. On October 19th his oil-rich province—the wealthiest in the country, measured by GDP per person—will hold a referendum. At issue is whether the provincial government should initiate a process that could one day see Alberta become an independent country. Mr Osadczuk plans to vote in favour.

Polls suggest his is a minority opinion. They generally find that at least two-thirds of Albertans would prefer not to go down that road. Even if the pollsters are wrong, separation would not be imminent: a second, binding referendum, and possibly years of negotiation with the federal government would have to follow. All that would provide off-ramps a-plenty.

Yet the vote adds to the troubles besetting a country that, in happier days, was

occasionally labelled boring. A narrow defeat could embolden the independence movement and encourage separatists in French-speaking Quebec, who on October 5th returned to power in that province for the first time in more than a decade. Mark Carney, Canada's popular prime minister, is in the midst of a trade war with the United States, the costs of which could quickly escalate. And in the background looms the underperformance of Canada's economy, which has stagnated for years.

Limping moose

Canada's GDP per person grew only about 4% in the ten years to 2025 after adjusting for inflation and shifting exchange rates, compared with 23% in the United States and 15% on average in the OECD, a club mostly of rich countries (see chart on next page). A recent study caused consternation when it concluded that Canadians had become poorer than Alabamians. "We haven't had a couple bad years because of Trump,"

says Philip Cross of the Macdonald-Laurier Institute (MLI), a right-leaning think-tank. "We've had a bad decade."

The culprit is a long slump in productivity growth. In the 1980s workers in Canada produced nearly 90% as much in an hour as their counterparts south of the border. By 2022 it was down to 71%. Between 2015 and 2023 productivity per hour worked in the private sector grew by just 0.8% annually, according to the OECD. Again, that is below the rich-country average and well below the United States.

Businesses have skimmed on investment, particularly since a crash in oil prices in 2014. Even as investment soared by 51% in America between 2014 and 2025, it inched up by only 4.2% in Canada, notes Mr Cross. Canadian businesses spend only about 1% of GDP on research and development, half as much as is typical for a rich country. Inefficient firms are sheltered from competition by thickets of regulation cultivated by provincial governments. ►►

► These raise costs and make it trickier for people in regulated professions to work outside the province where they were first licensed. In January the IMF concluded that, with these internal barriers, Canada was in effect imposing a 9% tariff on itself.

Another factor that may have weighed on productivity is a recent influx of relatively unskilled workers. After the pandemic the government of the day, led by Justin Trudeau, massively increased immigration to help businesses complaining about labour shortages. In 2022 and 2023 the population grew at the fastest pace since the 1950s, surging by more than a million people in both years. Now 42m, it is 10% higher than it was in 2020, and 16% more than a decade ago. The sudden expansion of the labour pool has given Canadian businesses less incentive to invest in the machines and training that would raise productivity in the long run.

The ballooning population also pushed up housing costs, which were already lofty. The Fraser Institute, another right-leaning think-tank, finds that housing starts in 2021-24 were about the same as in the 1970s, even though annual population growth was three times as high. High housing costs have reduced consumer spending and given bright young sparks more reason to try their luck abroad, many of them in America. Rising house prices have probably also diverted capital away from business, by making bricks and mortar look like a better investment.

Canada's separatist movements each have their own causes, but the national economy has provided little balm. Frustration in Alberta has festered for decades. The province has 12% of Canada's population but last year contributed about a quarter of both economic growth and exports.

Many Albertans feel that opportunities to develop their natural resources, for example through new pipelines, have been blocked by people in the more cosmopolitan conurbations of eastern Canada, whose votes have kept Liberal governments in charge of the federal government for two-thirds of the past century. This feeling sharpens grievances about money: Alberta's residents pay more to the federal budget than they get back in services. It ranks, in particular, that some of that cash helps support people who, because of environmental worries (among other anxieties), have ardently opposed drilling and mining in western Canada.

Alberta's pro-independence groups include hard-core MAGA-style outfits. In August *The Economist* attended a madcap meeting in a community centre hung with blue Albertan flags. Speakers railed against immigration. They called Canada's prime minister a "commie", a "pinko" and a "globalist", then repaired to a local bar.

But independence also has more main-



stream advocates (critics call them "separatists in suits"). On September 29th some 300 farmers and ranchers attended a community hall in Tofield, a town of about 2,000 people east of Edmonton, Alberta's capital. They queued up to shake hands with Keith Wilson, a bespectacled lawyer from Calgary, the province's biggest city, who has become one of the leaders of the independence drive. Mr Wilson denied that voting for separation would deeply scar Alberta's economy. Companies cannot just pick up the province's natural resources and depart, he said.

Mountie in a fix

This is the context into which Donald Trump's trade war with Canada exploded a little over 18 months ago. Exports account for about a third of Canada's GDP. In 2025 more than 70% of exported goods went to the United States. Among big Western economies, Canada's exports are the least diversified. For decades Canadian politicians have fretted about this reliance, but made little headway reducing it.

Mr Trump's tariffs on Canadian goods (and his idle talk of annexing Canada) have waxed and waned. But they shot upwards in August when he placed a 50% tariff on about \$20bn of goods, or about 5% of Canada's exports to America. Further increases loom: Mr Trump has promised to raise the

tariff on Canada's car industry from 25% to 50% on January 1st, should Canada fail to offer unspecified concessions.

The attacks are wounding Canada's economy, but not mortally. Most bilateral trade remains free owing to the US-Mexico-Canada trade agreement (USMCA), which Mr Trump himself signed in 2018. The average tariff on Canadian exports is near 8%, according to the Yale Budget Lab. Analysts at KPMG, a professional-services firm, think every percentage-point increase in the average tariff trims Canada's growth rate by 0.15-0.2 percentage points. The central bank expects GDP to grow by 0.7% in 2026 and 1.8% next year.

That is little comfort to the industries most affected, such as steel and carmaking, or to the worst-hit provinces. The effective tariff on goods from Quebec is probably twice as high as for the country as a whole. There are reasons to worry about the fight escalating further. A grim but remote scenario involves the suspension of the whole USMCA. Meanwhile the constant uncertainty is a brand-new obstacle to the investment that Canada so dearly needs.

For all that Mr Trump has tried to take from Canada, his gibes and attacks have given it something in return: a widespread, seething outrage that, harnessed wisely, could make many of its problems easier to fix. Sales of the Canadian flag began soaring soon after Mr Trump's second inauguration. (Normally, "No one wants to buy a flag in February in Canada because they would freeze their fingers off putting it up," says Matt Skipp, who runs a firm that makes them.) Canadians abandoned American booze when tariffs hit; supermarkets began slapping big "Made in Canada" stickers on their products.

Perhaps no one has benefited from the national mood more than Mr Carney. In early 2025, days before Mr Trump took office, Mr Trudeau, under pressure due to dire polling numbers, said he would step down as prime minister and leader of the Liberal Party. His successor's tenure seemed destined to be brief: an election was due and the opposition Conservatives were riding high. Hardly any Canadians could identify Mr Carney's picture, pollsters had said the year before. But he won not only the leadership but also the subsequent election, buoyed by a wave of anti-Trump, rally-round-the-flag indignation. "I told him in early 2025, 'You're the luckiest fucking guy in Canadian politics,'" says Jean Charest, a former premier of Quebec and an adviser to the prime minister.

Even now, the Conservatives are reeling: several of their MPs have defected to the Liberals. One recent poll concluded that 70% of Canadians approve of Mr Carney's government. This provides him with a huge opportunity, to push through reforms that could benefit Canada long after ►►



► Mr Trump leaves office.

The prime minister's first task is to defend Canada's interests without letting the spat with Mr Trump spin out of control. Canada is one of only a tiny handful of countries to have adopted counter-tariffs against America. Yet it has also offered concessions. Last year it ditched a digital-services tax that would have cost American tech firms. It has allowed itself to be humiliated in a bizarre bust-up over a bridge between Detroit and Ontario which the Trump administration refused to open until Canada agreed, retrospectively, to surrender some of its share of the tolls.

Mr Trump's mercurial malevolence makes Mr Carney's main economic project all the more urgent: to get Canada growing faster. In his first months in power he scrapped a consumer carbon tax, cancelled a planned rise in capital-gains tax that would have taken the top rate to 67% and cut the lowest rate of income tax. He has sought to trim the government's everyday spending to find more cash for investments. By 2029 he wants the federal workforce to be 10% smaller than at its peak in 2024. He has doubled down on earlier plans to reduce immigration and has promised to double housing starts to 500,000 a year over the next decade.

In September at a conclave of foreign investors Mr Carney announced a "productivity mega-deduction" permitting firms to write off spending on new equipment immediately. That builds on a "super-deduction" unveiled last year. The new rules will slash the effective corporate tax rate. The "Building Canada Act", meanwhile, speeds up approvals for big projects the government deems "in the national interest".

On October 1st Mr Carney posed by a hulking mining truck in Alberta's petroleum patch to announce that a new pipeline carrying oil to Canada's west coast had

become one of the first schemes to earn this designation. He says construction should begin in just under a year. That kills two birds with one stone: bolstering the economy by exporting more energy to Asia and mollifying grumpy Albertans.

Mr Carney is also seeking to lessen Canada's reliance on the United States and boost its place in the world. His government wants to double exports to other countries to C\$600bn (\$420bn) annually by 2035. In August Mr Carney claimed his government had struck more than 20 trade and security deals across five continents (though some are very vague). In January he went to China—the first visit by a Canadian prime minister in almost a decade—where he secured a lowering of tariffs on Canadian rapeseed oil, among other goods. In March he was in Delhi resetting ties with India, which collapsed in 2023 after Canada accused Indian agents of killing a Sikh activist near Vancouver. Canada says the goal is to double trade between the two countries to around \$50bn by 2030.

Poutine for two

The latest love-in is with the EU, Canada's second-biggest trading partner (although the destination of only about 6% of Canada's goods exports). In September Mr Carney gave an eloquent speech to the European Parliament in Strasbourg. Ursula von der Leyen, president of the European Commission, suggested Canada could one day become an "associate member" of the European Union, though that seemed more of a rhetorical flourish than a plan. More immediate opportunities will doubtless be discussed at an EU-Canada summit later this month. These include speeding up investment in critical minerals and collaborating more closely on defence. In February Canada became the only non-European country to join the EU's €150bn

(\$168bn) SAFE scheme, which provides low-interest loans to like-minded governments seeking to boost their military heft.

Gussying up the armed forces is a big part of raising Canada's standing in the world. (This, Mr Carney promises, will also provide plenty of opportunities for Canadian firms). In 2024 military spending was around 1.3% of GDP, one of the lowest rates in NATO. This year it soared to 2%, after one of the biggest year-on-year increases in defence spending in Canada's history. Now the plan is to double spending again, to 4%, as soon as 2030. Canada's generals are delighted: after years counting pennies, their main problem now is getting value for money on their spending spree. The government also wants to reduce the armed forces' reliance on American kit.

What does all this amount to? The corporate "mega deduction" is a big deal for investors, says Joseph Steinberg of the University of Toronto. He worries that other parts of the economic programme amount to "announcements, or the creation of new agencies that are intended to eventually make things happen faster". Efforts to speed up big, important projects are welcome, but do not alter politicians' habit of "picking winners" instead of improving the business environment for all.

Mr Carney's pugilistic talk is immensely popular with ordinary Canadians and Trump-weary foreigners. But business types and policy wonks see a high risk of provoking America's thin-skinned president with little upside. Firms will not commit billions of dollars in investment "just because somebody gives a nice speech", says Mr Cross of MLI. Canada's counter-tariffs split economists, too. Many think they increase hardship for Canadians without doing much to change Mr Trump's mind.

Other middle powers are not inclined to follow Mr Carney's lead when it comes to confronting Mr Trump (see International section). Mr Carney remains vulnerable to complaints about the cost of living, a worry Canadians reliably rank as their top concern. He is accused of high-handedness, turning up to Parliament only sporadically, for instance. Indigenous leaders gripe that they are not being properly consulted about economic development.

Yet zoom out, and there is little doubt that on many fronts Mr Carney is making progress that would have seemed unthinkable just two years ago. Although much of his programme resembles the policies of the opposition, his broad support allows him to go further and faster than they might have dared. Mr Charest, the former premier of Quebec, believes Canadians may one day thank America's president for shocking them out of a slumber. "The forces of inertia in Canada had become overwhelming," he says. "Trump is now telling us we have no choice but to change." ■



United States



Elections

On guard

FLORENCE, ARIZONA

Donald Trump has failed to change voting rules. Cities and states are preparing for mischief anyway

ON A FINE day in Florence, a city near Phoenix, staff at the local voting centre are doing a tabletop exercise, the euphemism to describe training for election hell. The point is to imagine calamities—fire, power cuts, bomb threats—then have a Plan B, C and D. Officials have always made some doomsday preparations, but this year's exercise is more thorough, and the range of threats broader. What, for example, should they do if federal law-enforcement agents show up at the polls?

The staff run through the protocols. Monitors from the Department of Justice (DoJ) can stay if they have an official letter, and indeed the government has said 1,000 will be dispatched across the country. Any other agents must leave unless they are themselves voting; Arizona law mandates a perimeter of 75 feet (25 metres) around precincts. "If they refuse to leave, that's when the scenario becomes a *scenario*," says an election worker in the recorder's of-

fice in Pinal county, of which Florence is the seat. In other words: call the sheriff.

Pinal is a Republican county. A portion of it lies in Arizona's 6th congressional district, one of several dozen competitive House races in the midterm elections on November 3rd. Our forecast suggests Democrats will flip the House and possibly the Senate, too. The nagging concern is that Donald Trump may try to subvert the election's legitimate results.

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His effort to overturn his loss in 2020 alerted everyone to the many pressure points in America's decentralised election system, and the lengths he might go to squeeze them. So far, his many attempted interventions this year have amounted to little, with Congress and the Supreme Court blocking his efforts to rewrite voting procedures. States, not the federal government, run elections, and their rules are mostly unchanged from past cycles. However, the executive branch has shifted from being a force to support electoral integrity to one undermining it, and in November the system will be tested once more.

Some changes represent not active interference, but the removal of help. Last year the Cybersecurity and Infrastructure Security Agency (CISA) stopped covering localities' costs to join a service for sharing cyber threats. Membership in the programme is down by around two-thirds. The upshot is that cyberattacks are more likely to proliferate, reckons Geoff Hale, formerly of CISA. "If a jurisdiction faces one and gets compromised or repels it, but if they're not sharing information about that attack, then other election jurisdictions remain equally vulnerable." Similarly, the FBI is said to have no plans to activate its election command centre, which in past years monitored threats and co-ordinated with local officials.



▶ However, election administrators increasingly view the federal government as a threat, too, says Jonathan Miller of Public Rights Project (PRP), a litigation group that represents local governments. Earlier this year the DOJ said it would prosecute officials who let non-citizens vote. Such voter fraud is extremely rare, but the spectre of voting by non-citizens propels the myth of election theft. It is the reason that MAGA activists want immigration enforcement at the polls.

Their presence would be illegal: federal law prohibits government officials from sending armed agents to precincts. On behalf of the city of Denver, PRP has sued the Department of Homeland Security, seeking to pre-empt anything like that on election day. The Trump administration says it has no intention of patrolling precincts, but that it may take targeted action, such as serving warrants against anyone suspected of being an illegal immigrant. Democrats fear that even the threat of agents near polling places will dampen turnout by minorities, who tend to vote Democratic. In a survey by UC San Diego, a third of Hispanics said they anticipate being questioned at the polls despite being citizens. Nearly half say they expect some form of intimidation.

Election experts' nightmare is that Mr Trump might try to seize voting equipment or ballots. That would break the "chain of custody", the controls that set out who can handle ballots and where they go, ensuring all are accounted for. Losing custody would make it hard to know whether ballots had been manipulated. "I would feel very uncomfortable about validating those ballots," says Stephen Richer, a former recorder in Arizona's Maricopa County. "Then you start going down the dark road of, like, do you have to call a new election?"

Two incidents concerning past elections have primed Democrats to the possibility of meddling. In January the FBI raided an election office in Fulton county, Georgia, and carted away material from 2020. Then in March, Chad Bianco, a Republican sheriff in Riverside, California, seized ballots that had been cast in a statewide referendum last year. Both the FBI and Mr Bianco cited misinformation in their requests for warrants.

Could there be a similar ruse in November's midterms? The previous incidents occurred long after elections were over, not in the middle of one. Ed Martin, a MAGA agitator, says that the president met this month with Tina Peters, a former county clerk who had gone to prison for giving a fellow election-denier unauthorised access to voting machines in 2021, and whose sentence was then commuted by Colorado's Democratic governor. Mr Martin, who described Ms Peters's meeting to an interviewer, offered this cryptic assessment of

the midterm elections: "The president's going to have to do what he's going to do."

State and local officials are on high alert. Colorado now requires county clerks to log everything, so that they have clear records if a judge ever orders material removed from their custody. One county official in Arizona says she has made sure her voting-machine vendor has extra supplies, so they are ready if the feds seize equipment. Gabriella Cázares-Kelly, the recorder in Pima County, along the Arizona-Mexico border, says lawyers there have restraining orders drafted if immigration agents show up. "They would plug in a few things, hit print and physically run the document over to a waiting judge."

Such scenarios remain very unlikely. Yet officials must also contend with election-denial activists, who routinely file nuisance public-records requests and challenges to voter registrations. In swing states such as Georgia, they have also managed to win

positions on local boards, with some aiming for statewide office this November. As administrators prepare for "what if" scenarios, there remains the not insubstantial task of getting the basic mechanics of elections right, which can be challenging enough, says Esler Musta of Arizona's Coconino County. In his case, that means preparing a mule caravan to serve voters who live at the bottom of the Grand Canyon.

Just half of Americans tell pollsters they anticipate a free and fair midterms. The tighter the margin in either chamber, the more uncertainty there will be to exploit in November. Lawsuits and recounts are now standard in close races. This year control of the Senate may come down to one or two states, including some that are famously slow to count, such as Alaska. A lengthy or contested count requires patience and restraint on the part of candidates. Those are not qualities often attributed to Mr Trump. ■

Politics in the Midwest

Adrift in Ohio

DELAWARE, OHIO

Vivek Ramaswamy is too MAGA and not MAGA enough

A COVERED PICNIC area in a park on a damp, blustery day is hardly an ideal spot for a political rally, so it was difficult to fault the members of the Delaware County Republican Party for their muted enthusiasm. At an event in a suburb of Columbus on October 10th some 75 people sat through an hour of speeches by candidates and local police officials. The high-

light of the show was Vivek Ramaswamy, a pharmaceutical billionaire and former presidential candidate who is the party's candidate for governor. He promised to be an even-handed and independent leader. "You don't just tell [people] what they want to hear," he said.

No more than 15 yards away, it was easy to find views that Mr Ramaswamy's crowd ▶▶



Too close for comfort

did not want to hear. In an adjacent children's playground Jared Hessler, a 39-year-old technology worker who was with his young son, explained that he will not be voting for Mr Ramaswamy. Mr Hessler used to vote Republican, but over the past two elections he has pivoted towards the Democrats and is enthusiastic about Amy Acton, the Democratic candidate for governor. "I would say that the main driving force is just being so sick and tired of Trump," he says.

That sentiment is a problem for Mr Ramaswamy. Mike DeWine, Ohio's term-limited Republican governor, won 62% of the vote in 2022 and Donald Trump has won the state in three consecutive presidential elections. Now most polls show Dr Acton with a slight lead. Mr Ramaswamy is providing too MAGA for Ohio's moderates and not MAGA enough for many Republicans.

Delaware County is the richest and best-educated in Ohio. Not long ago it was also at the heart of Republicanism in the state, with its residents favouring George W. Bush by 32 points in 2004. But as it has become more built up and diverse, it has shifted Democratic. By 2024 Mr Trump's margin was less than seven points.

Mr Ramaswamy has some traits that would, presumably, appeal to the suburban Republicans who have become sceptical of the president. In his speeches, he emphasises cutting business taxes rather than deportation. The son of Indian immigrants, he celebrates people who come to America legally and backs immigration reform. Last year he issued a stark criticism of his party's nativist wing in an article for the *New York Times*. Many of his campaign staff previously worked for John Kasich, a moderate Republican who served as Ohio's governor from 2011 to 2019.

In practice, however, he remains tainted by his links to an unpopular president with whom he has appeared at two rallies in the past month. At a party on the outskirts of a recent Ohio State football game (as close as a secular event can come to being sacred), former Republicans were easy to find. Voters for Mr Ramaswamy were not. "I am going Democrat all the way, even though I'm a Republican," said one enthusiastic middle-aged tailgater named Debbie. Mr Trump is the reason why. "The insanity of this particular administration has just put me over the top," she explains. It is Dr Acton, who led the state's response to the covid pandemic, who is seen as the moderate. In 2020 Mr DeWine called her a "hero". Mr Trump is trying to rebrand her as a "radical-left lunatic".

Mr Ramaswamy has another problem, too, on his right. In the primary election his opponent, Casey Putsch, holding a rifle, invited Mr Ramaswamy to "play cowboys versus Indians". He also attacked him for being "a HINDU man!" Mr Ramaswamy

beat him handily, but Mr Putsch still managed to win 18% of the vote. Nick Fuentes, a white-nationalist podcaster with a devoted following, said last year that his main goal for 2026 was "to deny Vivek Ramaswamy the governorship". This month he endorsed Dr Acton, calling Mr Ramaswamy an "anchor baby".

Pinched from both sides, Mr Ramaswamy is resorting to an exceptionally ugly campaign. His adverts and those of the superPACs supporting him centre almost exclusively on Dr Acton. Some allege she is a drunk and a drug addict (based on a police report of her having a shouting match with her husband). Others accuse her of being responsible for the death of an elderly woman during the covid pandemic (the woman had in fact lived and died in Kentucky). Mr Ramaswamy will probably run for president again if he does become governor. But for a man seeking to lead his party, he looks increasingly lost in it. ■

The tech backlash

The centre cannot hold

ASHVILLE, OH AND SALINE, MI

The AI boom is pushing voters left

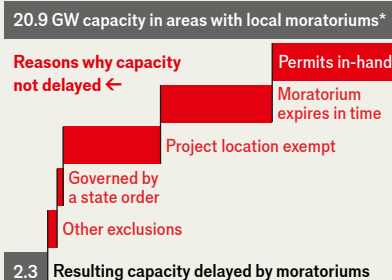
TO SPOT THE site of a new data centre, look for the cranes. About a dozen soar over the fields of Saline township, Michigan, visible for miles around. Another hint is the convoy of cement-mixers trundling down the road, loudly and constantly. When the OpenAI and Oracle project in Saline, "The Barn", is finished, it will consume more power than a midsize city.

Beside it is the Rustic Glen Golf Club, where a few locals are enthusiastic about the project. "They've been talking to us, and they're going to do a lot of nice things for us," says a cashier. The data-centre developers have bought the club and have

Delayed impact

2

United States, data centres, September 2026



*Including statewide moratorium in New York
Source: SemiAnalysis, Maya Barkin

promised to inject cash. Fred, a farmer standing atop a tractor across the road, offers a more typical reaction: "There's nothing good I can say about it...that was a beautiful piece of farmland, and they destroyed it." Drinkers at a nearby brewery say the same, a little more politely, and grouse that the golfers were paid off.

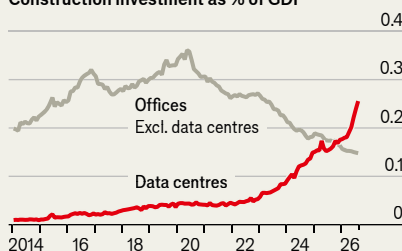
Across America, data centres are popping up at startling speed. Since last November more money has been spent building data centres—not including the expensive chips inside them—than new offices (see chart 1). President Donald Trump has warned that places opposed to data centres risk becoming "backwards and poor", but Republican candidates are trying to be more attuned to voters like Fred. In Michigan Mike Rogers, a Republican Senate candidate, supports a pause on building. Such moves may be too late. Our analysis of polling data suggests that, as anxiety over data centres grows, the projects seem to be pushing voters towards Democrats.

We matched almost 150,000 respondents from the *Economist*/YouGov weekly survey with their nearest data centre, using Compute Atlas, an open-source repository of such sites. Voters across the country are shifting towards Democrats, but for those living within 2km of a data centre the veer has been even sharper. Americans who live

When the chips are down

United States

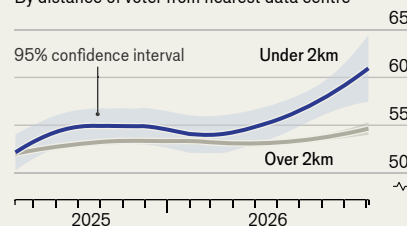
Construction investment as % of GDP



*After controlling for respondent demographics *Excluding undecided voters and minor parties
Sources: Bureau of Economic Analysis; Census Bureau; *The Economist*/YouGov; Compute Atlas

Democratic vote share*, %

By distance of voter from nearest data centre†



near a data-centre site are around six percentage points more likely to support the Democrats than those who live further away (see chart 2 on previous page). Six months ago there was no such difference.

For Brandon, who is circulating a petition against data centres in Ohio, the issue has turned him from a Republican into a swing voter. Local Republicans refused to help his cause, he says, but “the Democrats have been amazing.” Michigan and Ohio are already home to more local moratoriums than any other states.

Why have data centres caught fire politically? Throughout dozens of conversations, voters seldom brought up AI-related concerns directly. The most common fears

were practical ones, about water pollution, higher electricity bills or a hit to house prices. Neither politicians’ promises that the projects will pay their own way nor developers’ efforts to bat away concerns with cash seem to have done much good. Whatever the truth is, practical assurances count for little when voters so deeply distrust both government and big businesses: confidence in each is near 50-year lows.

The real-world effect of all that opposition has, so far, been limited. Maya Barkin of SemiAnalysis, a research firm, finds that only 2.3 gigawatts’ worth of projects are likely to be delayed by moratoriums. But with discontent growing, the political impact is more assured. ■

Fuel prices

A slippery deal

WASHINGTON, DC

Donald Trump turns to Vladimir Putin for relief at the pump

“THE EUROPEANS are still sending money to Russia for energy,” complained Scott Bessent, America’s treasury secretary, in January. “It is so absurd. They are financing the war against themselves.” So too, now, is America. On October 9th Donald Trump—who just weeks ago signed into law a bill requiring tariffs on big importers of Russian oil and gas—said that Vladimir Putin, Russia’s president, would sell millions of tonnes of diesel fuel to America. The deal has sparked a minor rebellion among Mr Trump’s supporters. Worse, it is unlikely to achieve his goals.

Mr Trump’s motivations are mixed. His advisers portray the deal as an effort to pave the way for peace talks; the president also announced a Russia-Ukraine energy ceasefire, which was denied by Ukraine and ignored by Russia. European diplomats suspect that some of the president’s aides are desperate to re-establish economic ties with Russia. But a more pressing concern for Mr Trump is rising prices at home. Annual inflation hit 3.7% in September, driven by higher energy costs.

America is a diesel exporter, but a global shortage has pushed up prices everywhere. The main cause is the war in Iran and the disruption of tanker traffic through the Strait of Hormuz. Ukraine’s strikes on Russian refineries have made matters worse. Diesel costs \$6.29 per gallon in America, up 72% from a year earlier. That could have political consequences: of seven “toss-up” Senate races in November’s midterm elections, four are in states that use more diesel than average, according to *The Economist’s* calculations.

Mr Trump seems to hope that more Russian diesel exports will pull down prices before the midterms. But he is likely to be disappointed. Russia is struggling with diesel shortages of its own. The quantity pledged in the deal is tiny relative to global consumption. Moreover, Russia would almost certainly have exported that diesel anyway. And even if Ukraine stops striking Russian refineries, any increase in production is likely to come after America votes.

Opponents of the president accuse him of stretching, if not breaking, the law, citing the Ending Importation of Russian Oil Act of 2022. The clear intent of the law is that it should prohibit these imports, says Peter Harrell of Georgetown Law School. The act was implemented through an executive order whose wording might give

Sumo wrestling

One big beautiful sport

PEACHTREE CITY

Will Americans embrace Japan’s ancient pastime?

ON A RECENT evening in Peachtree City, Georgia, Katie Hardeman was training her Black Dragon “boys”. For two hours she put the aspiring sumo wrestlers—mostly middle-aged men—through a gruelling workout. Then she invited your correspondent to have a go, strapping her into a *mawashi*, the Japanese loincloth, and instructing her to charge headfirst into a man’s chest, palms aiming for “tits and pits”. “There’s something electric about it,” says Ms Hardeman, a combat veteran. “We’re trying to overcome the negative connotation in our country that sumo is just fat guys in diapers pushing each other.”

On October 10th the Sumo Championship League held its debut match in Austin, Texas. The league is the first of its kind on this side of the Pacific. Sixteen wrestlers competed until the third seed, a 21-year-old Floridian, won gold.

Stuart Snyder, the entertainment guru behind the event, was once chief operating officer at World Wrestling Entertainment, which for decades has staged fake smackdowns. After he saw cornhole, in which adults toss bean bags through a punctured plank, go viral online, he decided fringe sports were having a moment—and sumo was next. With \$5m in hand, he is betting he can hook Americans on a pastime rooted in Asian traditions.

Many of the league’s aspiring stars are new to it. Jonithan “Jiva” Pilgrim was living at a Hare Krishna commune when he discovered sumo on YouTube. Realising he had “no other nature than to be a

warrior”, he joined a club and gained weight on a diet of whey shakes, tofu and ghee. His club-mate Dominus “Domzilla” Davis-Williams, the league’s heaviest wrestler at 450lbs (204kg), is a former player of American football. Sumo “felt familiar”, he says. And it does wonders for his “body positivity”.

To help sumo grow, a few customs may adapt. In Austin some wrestlers went “traditional” and wore just the *mawashi*, leaving their buttocks exposed. Others snuck shorts underneath. Americans, reckons Mr Pilgrim, will swoon for sumo, but they may not be ready for “that much naked male body”.



A cheeky debut

► Mr Trump a tenuous justification for issuing temporary licences. Democrats tried to close that loophole in April but were rebuffed by Republicans. Still, the legal uncertainty may cause firms to stay away. “What company is going to risk liability for importing Russian oil under these circumstances?” asks Dan Fried, who once led America’s sanctions policy against Russia.

The political blowback has been swift. On October 13th a dozen senators, including six Republicans, signed a letter to Mr Trump describing the deal as “a gift to our adversary and a betrayal of our allies”. Among them were the independent-minded Susan Collins and the outgoing Thom Tillis, who has threatened to use a military spending bill as leverage to stop the deal. But criticism has also come from Republicans once reluctant to take on Mr Trump, such as Mike Rogers, a Senate candidate in Michigan, and Dan Sullivan, an Alaska senator facing a tough re-election fight. Privately, Republican aides are scathing about what they see as needless folly. “I expect”, says one, “it will go away quietly.” ■

How to be a Democrat

The Jon Ossoff playbook

A rising star in Georgia pairs bland governing with hot rhetoric

NEARLY A DECADE ago a documentary exposed widespread corruption in one of Africa’s top football leagues. The Ghana Football Association was dissolved and dozens of officials were sacked. “Corruption and self-dealing are at the heart of a lot of the dysfunction and suffering in the world today,” one of the film’s producers said at the time.

Eight years on, that producer is a senator from Georgia running for re-election on the same message. Across the state, Jon Ossoff tells a simple story: Donald Trump and his “Mar-a-Lago mafia” have exploited the rot in American politics, enriching themselves while raising costs for ordinary Americans. In a debate on October 8th Mr Ossoff pressed his case, claiming his opponent, Mike Collins, had “sold out Georgia in his pathetic, childlike devotion to Donald Trump, voting for the tariffs that have sent groceries soaring, voting for the health-care cuts that have doubled your insurance premiums, and voting for the war that sent diesel to its record high”. In a state that Mr Trump won by two points in 2024, Mr Ossoff leads in every major poll.

Republicans’ current weakness makes it easier for Mr Ossoff to shine. The president’s net approval rating in Georgia, at

-30% according to *The Economist’s* tracker, is tied for the lowest among battleground states. And Mr Collins, a congressman, has been dogged by revelations of ties to white supremacists. But as Democrats consider how to succeed beyond the midterms, Mr Ossoff offers one answer. As a campaigner he is a firebrand. When it comes to governing he is deeply uncontroversial.

First elected in 2021 at the age of 33, Mr Ossoff is the rare Democrat who is able to straddle the divide between the party’s progressive and moderate wings. But running in right-leaning Georgia, he also needs to appeal to Republicans. Charles Bullock of the University of Georgia estimates that Mr Ossoff can carry Georgia in November only if he earns the vote of 40% of white college-educated voters and at least 20% of white non-college voters, most of whom are conservative.

So, as a senator, Mr Ossoff is competent and bland. Republican strategists grudgingly admire how responsive he is to constituents. At a conference of Georgia mayors a few years ago, a panellist asked the crowd who had received a cold call from Mr Ossoff. Nearly every hand went up. In August two Republican mayors endorsed him. Scott James Matheson, of Valdosta, credited Mr Ossoff with securing \$2m for buses in the city and said he was the first politician to visit after a hurricane. The other, Julie Smith of Tifton, told local press: “I’m a Republican, but there are times when a person exceeds the party.”

Mr Ossoff’s Senate record is strikingly uncontentious, focused on reforming foster care, making military housing safer and bringing green-manufacturing jobs to Georgia. His only vote that might count as controversial was against blocking federal funding for schools that let transgender women compete in women’s sports. “It’s

hard to peg where he actually is on an ideological spectrum and that’s a damn good thing,” says John Anzalone, a pollster.

As a storyteller, however, Mr Ossoff is sharp. He writes his own speeches; his team is adept at splicing his appearances into clips that go viral. Mr Trump, he says, is a “draft-dodging crook” and “the world’s most famous sore loser”. This summer Mr Ossoff mocked the president for wanting to “travel with Natalie” Harp, a close aide, on his Qatari-gifted jet.

This has the desired effect. After his comment about Ms Harp, MAGA-world erupted on X. Mr Trump nicknamed him “Pee-Wee Herman”. The spats keep him in the news and cast him as the fighter Democrats are craving. That, in turn, drives donations. The senator has out-raised his challenger by a factor of 12.

In his stump speech Mr Ossoff argues that Mr Trump and his friends have taken corruption to “spectacular new heights” and that this is why “nothing works for ordinary people”. He then calls on Americans, regardless of party, to take back their government. To drive the point home, he invokes John Lewis, a lion of the civil-rights movement whom Mr Ossoff claims as his political mentor. “He kept reminding us that we all live in one American house.”

That helping of positivity is deliberate. “As Democrats we’ve learned our lesson that we have to present an alternative narrative that politics can do good,” says Jonae Wartel, who ran the Georgia Democratic Party’s run-off effort in 2021, which included Mr Ossoff’s race. The senator, she explains, knows that he can’t just be the “anti-guy”. After the midterms, the question will be whether he wants to be the guy. “I have zero interest in running for president,” Mr Ossoff has said. Of the senator’s many claims, that’s his least convincing. ■

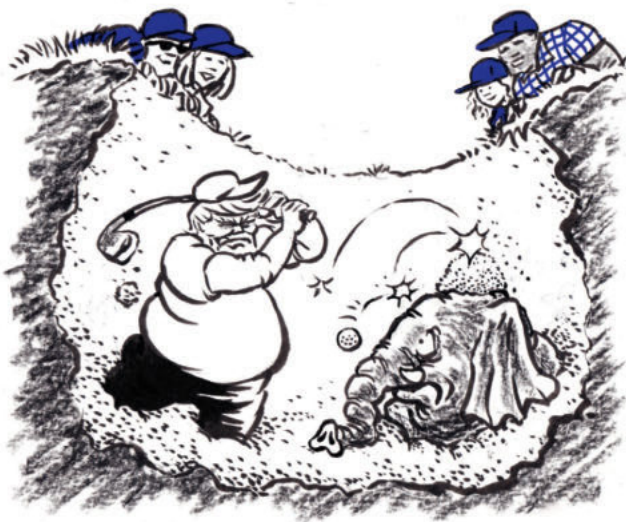


Many will

LEXINGTON

The Biden trap

Republicans should not repeat Democrats' mistakes after the 2022 midterms



THE NEWS rushes ahead so swiftly now that even recent events can vanish in the rear-view mirror, to be recalled dimly, if at all. But cast your mind back, if you can, to four years ago. In mid-October 2022 petrol prices were nearing \$4 a gallon, and 30-year mortgage rates were spiking to 7%. Only one in five Americans thought the country was heading in the right direction, and the approval ratings of the president, Joe Biden, were dismal. Analysts noted that Democrats were struggling to defend seats in districts Mr Biden had won by double digits in such reliably Democratic states as California and New York. Not just a red wave but a “red tsunami” was coming, crowed Senator Ted Cruz of Texas. “Tomorrow, its immense swell will make landfall,” the *American Conservative*, a right-wing publication, predicted on election eve.

The immense swell, it turned out, was in the advance hype. The Republicans won a majority in the House, but it was the Democrats who emerged elated. They had confounded expectations and overcome the historical pattern of midterm elections by losing a net of only nine seats in the House and gaining one in the Senate, where they held the majority. That outcome should be a caution to Democrats now, as they grow giddy at the hope of their own tsunami next month. But the real lesson is for Republicans: what seemed like happy news for the Democrats in 2022 turned out to be a disaster for them.

When Mr Biden held a press conference the day after the midterms to celebrate what he called “a strong night” for Democrats, he was asked what he would now do differently. “Nothing,” he replied. Americans, he explained, were just learning to appreciate the great achievements of his administration. “The more they know about what we’re doing, the more support there is,” he said. After the midterms, aides who had privately wondered whether Mr Biden should run for a second term cast their doubts aside, and other party leaders publicly fell into line behind him. At that press conference, Mr Biden declared that the outcome of the midterms meant the MAGA Republicans were “not taking over the government again”. Two years later they did just that.

Do the Democrats have a bigger advantage in 2026 than the Republicans did in 2022? Probably. In 2022 Republican candidates

had to contend with anger at the Supreme Court’s *Dobbs* decision, handed down in June that year, which eliminated a constitutional right to abortion. That energised not only reliable Democratic voters but also a constituency that had drifted away from the party—white women without college degrees. At the same time, though Democrats, then the party in power, were competitive financially in 2022, Republicans have extracted an extraordinary advantage during this election cycle. Further, Donald Trump’s push to gerrymander more districts ahead of this election may have added about eight seats to the Republicans’ total.

The biggest difference in 2026 that favours the Democrats is passion. In 2022 voters who described themselves as “extremely motivated” to go to the polls were evenly divided between the parties, according to polling by the Pew Research Centre. In 2026, according to Pew, 59% of such fired-up voters favour the Democrats, while only 35% favour Republicans.

Whence this motivation gap? Everyone knows the answer, but Republicans are scared to admit it. Voters are not inspired by a coherent Democratic legislative agenda. In contrast to 1994, when Republicans united around Newt Gingrich’s “Contract with America” to win a thumping victory in the House, and to 2006, when Democrats campaigned on a six-point plan they called “Six for ‘06”, no one in this cycle could hope to distil the aims of the opposition party on a notecard. Nor can it be said that even Democrats—let alone the wider public—are thrilled with the party. Only 48% of Democratic voters approve of the job their party is doing now in Congress, according to a poll last month by Quinnipiac University. Among all registered voters, that proportion is 21%.

What Democratic candidates have going for them is, simply, rejection of the Trump presidency. Every midterm election is a referendum on the sitting president, but that appears to be truer this year than ever. Fully 44% of registered voters view their vote for congressional representatives as a vote to oppose him; only 19% want to signal support for him. The election-forecast model devised by *The Economist* gives the Democrats an astonishing three-in-five chance of winning the Senate, and a 19-in-20 chance of winning the House. But gerrymandering and polarisation make it far harder for a party to achieve the kind of whopping gains Republicans made as recently as 2010, when they netted 64 seats. The *Cook Political Report*, a sober prognosticator of elections, estimates the Democrats will gain between nine House seats—the same number as the Republicans netted in 2022—and 19 seats.

The coming red wave

When Republicans lose, Mr Trump looks for someone else to blame. “If they win, I should get all the credit,” he said of his endorsed candidates in 2022. “And if they lose, I should not be blamed at all.” In 2026 he should get the blame whether Republicans take a shellacking or, by beating the expectations game, eke out the phoney validation Mr Biden claimed four years ago. Mr Trump put his party in a hole by promoting candidates in states such as Texas and South Carolina based on loyalty to him rather than skill and appeal. More important, he has made lousy choices in office that have made him historically unpopular. Yet even more than Mr Biden, this president can be counted on to keep governing as he has, regardless of the midterm result. He cannot run again. But those Republicans who hope to succeed him as president in 2029 should learn from the Democrats’ mistakes and begin, politely but decisively, to distance themselves from him. ■

The Americas



Cuba and the United States

Getting the motors running

MEXICO CITY AND MIAMI

Donald Trump's oil blockade is starting to have curious effects

FOR YEARS Cuba relied on Venezuela to supply much of its energy. Things have changed a lot in the past nine months. Now Cuba is getting all its fuel from the country's great nemesis, the United States—perhaps as many as 3.2m barrels in July, according to figures recently released by the US Energy Information Administration, a government agency. And whereas the fuel from Venezuela was being bought by Cuba's government, which at that point monopolised the trade, this time it is (at least in theory) flowing to the Cuban private sector instead.

This changeabout is one result of America's evolving policy towards the island. Donald Trump and Marco Rubio, his Cuban-American secretary of state, came to power in 2025 promising to squeeze Cuba's communist government, which has misruled the island since 1959. In January

American special forces captured Nicolás Maduro, Venezuela's dictator, and jailed him in New York; in the wake of that, Mr Trump was able to force Venezuela to stop sending Cuba fuel. America's president also threatened tariffs on any other country shipping energy to Cuba's government, which scared off Mexico, too. The idea seemed to be not just that this would make life difficult for the Cuban government but also for its people, increasing the chance that they might seek to topple the regime of their own accord.

The blockade has caused much suffering. The government was already strugg-

ling to provide power to the island, because of ageing infrastructure and cash shortages. *Apagones* (blackouts) have grown so common as to have become the norm. These days the bigger surprise for Cubans are the *alumbrones*—moments when the power comes on. Additionally, America's fuel blockade paralysed public transport, prevented distribution of food and other goods, and as a result caused prices for all sorts of things to soar.

Faced with crisis, in February Cuba's government began letting the island's private businesses import fuel and started permitting entrepreneurs to lease petrol stations that were previously state-run. The United States likewise gave American sellers permission to export light fuels—diesel, petrol, propane and the like—to Cubans outside government. (A separate, subsequent policy allows American firms to resell Venezuelan crude to Cuba's private businesses—but no privately owned firm in Cuba has the ability to refine crude or to run a power station, so for now only light fuel is moving.)

These new imports are not fixing the problems with the energy grid, which is managed by the government. People still sit in the dark at night; food still rots in idled fridges and freezers. ▶▶

→ ALSO IN THIS SECTION

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► But the influx of light fuels has lessened some problems, all the same. Cars are back on the roads; public transport has picked up. People and businesses lucky enough to afford private generators are finding it a bit easier to run them. The price of petrol has dropped to around \$2.50 a litre, half the price before the surge in American fuel began. There is even price competition between the petrol stations, says Omar Everleny, an economist in Havana.

The new fuel trade is a boon to Cuba's downtrodden private businesses. Successful administrations in Washington have said they want to empower entrepreneurs. And for some years Cuba's government has been grudgingly giving private firms more room, as its ability to meet people's needs has shrivelled. It legalised freelance work in 1993 and small businesses in 2021. This year it hurriedly passed an impressive-sounding batch of 176 reforms. Largely to appease the Americans, and dig itself out of a hole, it gave somewhat more space to the private sector.

By ending the state fuel monopoly, the government has handed entrepreneurs a new and profitable line of business. "Our policy on Cuba has already caused the largest ever privatisation of Cuba's economy," boasts the State Department. The hope is that to get the oil it needs for its power stations, the regime may privatise bits of Cupet, the state oil company, too. On October 12th Cuba passed a law encouraging private participation in the entire oil industry—in the hope of producing more oil itself.

Booming oil sales emphasise how Cuba now depends on a country it still formally considers an enemy. It has not been able to lean on allies, such as China, Mexico and Russia, to help assuage its oil problems. The United States is also Cuba's biggest single foreign source of food. In three years it has gone from Cuba's tenth-largest trading partner to its largest, overtaking Spain and China. All this is giving the Trump administration leverage.

Some question exactly how fully the fuel deals are cutting out Cuba's government. Yes, the state has leased petrol stations to businesses—but its own tankers can be seen filling up at them. The government is not getting oil for its power plants, but some American diesel may be making its way into the 52,000 government-owned generators that supply power to the grid in some areas. Many Cubans are pleased that petrol has dropped in price, but they warn that the new fuel barons are sons and daughters of bigwigs in government. "The people involved in that business are mainly from the *cúpula*," says a Havana resident, using the Cuban term for the ruling elite. There is a danger of merely swapping totalitarianism for oligarchy.

Some United States officials seem not

to mind. However much they despise Cuba's communists, they do not want a humanitarian catastrophe 90 miles (145km) off the Florida coast. And they can at least claim that their policies towards Cuba have been unabashedly "America First". The fuel trade is helping mint a new generation of Cuban-American entrepreneurs in Florida. And if it becomes feasible for Cuba's private businesses to import and make use of crude oil, that will come via the United States from Venezuela. In other words, it would be from the same source as before Mr Trump's oil blockade, but with

American business folk now inserted bluntly in the middle.

Muddled policymaking in Washington risks sabotaging some of what is currently being achieved. On September 30th the Trump administration moved to freeze American bank accounts being used by Cuban entrepreneurs—hurting the very people whom its fuel policies have recently empowered. Mr Trump, in trying to topple the Cuban government, may inadvertently have struck upon a policy that can boost the private sector and loosen the regime's grip over the island's unhappy people. ■

Venezuela's reforms

Freedom postponed

GUATIRE

The regime's political opponents are still languishing in jail

RODEO IS A notorious prison near Caracas, Venezuela's capital. In one of its towers, people who fell foul of the country's grim regime are held in tiny cells with open latrines. The heat, smell and bugs are unbearable. Televisions play propaganda. And then there is the torture. Wilder Vásquez, 32, who was held there as a political prisoner for almost three years, says the director welcomed him to the prison with a taunt: "Only God can get you out of here."

In the end, he was sprung by Donald Trump. It is nine months since America's president dispatched special forces to snatch Nicolás Maduro, the former dictator—only to replace him with his deputy, Delcy Rodríguez. Mr Trump boasts of his control over Venezuela. Mr Vásquez is one

of 1,104 political prisoners who have since been released. Yet there are still more than 300 languishing behind bars, many in Rodeo, according to Foro Penal, an NGO. Relatives of these inmates, some of them camping outside the prison gates, struggle to understand why.

The issue underlines tensions at the heart of the new relationship between the United States and Venezuela, says Phil Gunson, an analyst with Crisis Group, another NGO. The Trump administration has extraordinary leverage over Ms Rodríguez. Everyone knows that it could snatch her, just as it snatched her boss. The United States controls Venezuela's oil exports, too. And yet it still depends on Ms Rodríguez's regime to run Venezuela day-to-day. ►►



A painful wait

► “The United States cannot simply remake Venezuela in the way we want overnight,” says Mr Gunson.

America’s priorities in Venezuela are business, stability and democracy—in that order. It does not want to repeat mistakes made in Iraq, where regime change led to civil war. So it has kept the *chavistas* in power. The regime has churned out economic reforms. But Ms Rodríguez may be arguing that too much political change, too quickly, risks derailing that process. “We are still in Delcy’s world,” says Alfredo Romero of Foro Penal.

Political prisoners are useful for the regime. They are not only chips for bartering with the Americans; their continued incarceration helps make clear to Venezuelans that the regime’s ability to quash dissent remains intact. Venezuelans have been less fearful since Mr Maduro was arrested. Protests are rising: August saw almost four times as many as in the same month last year. The regime needs to retain a degree of “social control”, says Andreina Baduel. Her late father, Raúl Baduel, died a political prisoner in 2021. Her brother Josnars is currently in Rodeo.

Some political prisoners have a specific jailer: a person with a grudge who needs to be convinced to release them. And almost half of those remaining have a military past. Many are senior officers accused of rebellion. Keeping them locked up is a way of controlling the armed forces, says John Polga-Hecimovich, an academic at the US Naval Academy in Maryland. The regime could be worrying that, if released, some of them might talk to United States prosecutors about the regime’s corruption and involvement in drug trafficking.

On October 8th the US indicted Mr Maduro and his wife, Cilia Flores, for using torture to hold power. Many prisoners tell stories of that. Ms Baduel says the ligaments in her brother’s knees and shoulders are broken. Squatting over the latrine in his cell is agony. Hiowanka Ávila, whose brother was arrested for alleged involvement in an attempt to assassinate Mr Maduro with a drone, says he was beaten, electrocuted and asphyxiated. He was put in stress positions and left hanging from his wrists for days. “And that was just the physical torture,” says Ms Ávila.

Conditions in Rodeo have improved since Mr Maduro was whisked away. Families have been allowed to embrace their relatives during visits. Each prisoner has been given a pillow. The violence against them has abated. The families who camp outside the prison still hope their loved ones will be released soon (a procession near the prison is pictured on the previous page). But they are anxious, too, that something might curtail the political transition. Says Ms Baduel: “This episode of horror for Venezuelans is not totally over yet.” ■

Gambling

All bets are off?

SÃO PAULO

Brazilians love to wager. They are wrestling with the cost

A HAPPY TIGER is tormenting Brazil. Wearing a red tang jacket, the fat cat dances across phone screens; it is the mascot for a wildly popular digital slot machine. But late last month Brazil’s government banned the “little tiger game”—along with all online casinos and sports-betting. “People are in debt, killing themselves, and getting sick from a disease called ludopathy,” said the president, Luiz Inácio Lula da Silva, justifying his executive order.

Since it was legalised by a right-wing government in 2018, gambling has exploded in Brazil. Last year the country became the world’s fifth-largest betting market. Punters lost over \$10bn, more than Brazilians spent on cigarettes and McDonald’s combined. Though it generates lots in taxes—gambling contributes nearly as much to the public finances as agriculture—many Brazilians have turned against the sector. Businesses blame it for record household and public debt, as well as low spending in shops. Church ministers and doctors warn that gambling firms are enslaving the poor and the young.

Prohibition has a chequered past. Brazil forbade games of chance in 1946, shutting venues from betting houses to bingo halls. This pushed punters towards the *jogo do bicho* (animal game), an illegal lottery run by racketeers. Wealthy *bicheiros* soon infiltrated politics and the formal economy; they tried to seem nice by sponsoring samba schools. When gambling was legalised the idea was in part that this would curb their power. Yet the law that was passed to permit it neglected to regulate the sector. It initially imposed no taxes on the industry,

or any rules on advertising.

In 2024 Lula (as the president is known) tried to fill in the blanks. His government limited gambling advertising, began stopping gamblers from betting with credit cards and introduced rules such as age verification. His government also began charging operators a 30m reais (\$6m) licensing fee and a 12% levy on revenues. Installing such safeguards was difficult, says Daniele Cardoso of the Secretariat for Prizes and Gaming, the industry’s regulator. Yet officials led by the cash-strapped finance ministry believed they could weaken organised crime, protect gamblers and keep a lid on addiction—all while creating new revenue for the state.

Fat chance

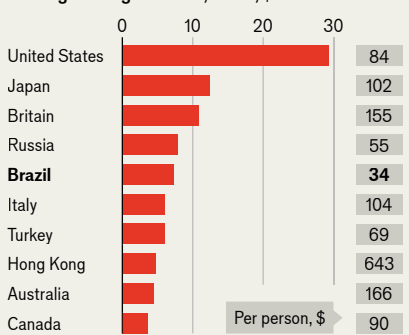
Their efforts seem to have failed. Punters who spent their money gambling, rather than ploughing it into more productive things, chopped 1% off Brazilian GDP last year, estimates Guilherme Klein of the Federal University of Rio de Janeiro. That was worse than the impact of Donald Trump’s tariffs on Brazil. The *bicheiros* have not been edged out: they have simply moved online, where they run both legal and illegal sites, according to Anchieta Nery, an intelligence chief at the justice ministry. More people are wagering high sums and racking up debt, notes Luiz Orsatti of Procon-São Paulo, a consumer-protection agency. In 2025 an academic survey found that some 7% of Brazilians engage in problematic gambling, compared with 2% in Britain, another hotspot.

There is no easy answer. Top football clubs, many of them sponsored by gambling firms, have insisted that permanently outlawing the industry could mean “the end of Brazilian football”. Some of their players have lately taken to the field wearing slogans protesting against the ban. Betting companies are threatening to sue the government for the \$500m they have paid in licensing fees; their lobbyists argue the ban will feed an illegal market that already accounted for 30% of the sector.

Lula’s ban aimed to please poor and evangelical voters ahead of the presidential election (the run-off is on October 25th). He, nonetheless, underperformed in the first round. His rival, Flávio Bolsonaro, is said to favour lighter rules—perhaps shutting online casinos but allowing sports bets. It is still anyone’s game. ■

Chancers

Gross gambling revenue*, 2025, \$bn



Asia



El Niño in Asia

Turning up the heat

BANGKOK AND SINGAPORE

Can governments grappling with an energy shock prevent a food one?

BACK IN MAY about two tonnes of dead fish floated to the surface of a lake in Cambodia. Last month in Indonesia receding water levels in another lake exposed the ruins of Somang, a long-submerged village. In the Philippines officials have warned residents of Manila, the capital, that their water supply may soon be reduced. These events—all caused by hotter, drier conditions—may seem isolated, but taken together they point to the havoc that El Niño could bring in Asia.

El Niño is a naturally recurring climate pattern. Every few years a shift in the winds above the eastern Pacific raises temperatures and reduces rainfall in much of South and South-East Asia. This year's episode, which began in May and is due to peak next month, is unusually fierce. On one daily measure, sea-surface temperature anomalies in the Pacific have already exceeded the peak of every previous event on record (see chart on next page). The

World Meteorological Organisation expects this El Niño to last into February.

The effects will be global, but Asia is especially exposed: hundreds of millions of its people depend on farms for their livelihoods, and its governments are still grappling with the energy shock from the war in Iran. El Niño is already causing damage. India's monsoon, which supplies nearly 70% of annual rainfall, ended about 13% below normal levels—the driest in a decade. Satellite data suggest that Indonesia is enduring its worst fire season for 11 years. In the Philippines officials say that

seven provinces are already experiencing drought, and that the entire country could be in drought by early next year.

The most direct impact will be on food. Farmers who depend on rainfall will be hit hardest, especially in Indonesia, where the main rice crop is planted between October and December, just as El Niño peaks. But irrigated farms are not immune, because the lack of rain is draining reservoirs. In central Thailand that prompted the government to ask farmers not to plant a second rice crop this year.

All this comes on top of the Iran war's disruption to fuel and fertiliser supplies. The World Bank expects fertiliser prices this year to average 38% higher than last year. Higher input costs and extreme weather are squeezing farmers' incomes, and contributing to food inflation. Yet the bigger worry is supply. Krungthai, a Thai bank, reckons Thailand's rice output could fall by 18% between now and the middle of next year. Thailand has plenty of reserves, but other countries have little to fall back on. Bangladesh's rice stocks amount to less than 4% of its annual consumption, according to data from America's Agriculture Department.

To gauge which country is most exposed *The Economist* has built a "vulnerability index" for 11 of Asia's emerging economies. It combines two sets of measures: ►►

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► how much El Niño could hurt their economies (based on the importance of agriculture to them), and how well governments could cushion the blow (based on indicators of fiscal space and the reach of welfare systems). Sri Lanka, Bangladesh and Cambodia come out worst (data for war-torn Myanmar are patchy, otherwise it would probably top the list). Unsurprisingly, richer countries—Thailand and Malaysia—tend to fare best. The pain takes different forms. In India the risk falls mainly on farmers; in the Philippines and Bangladesh it falls on consumers.

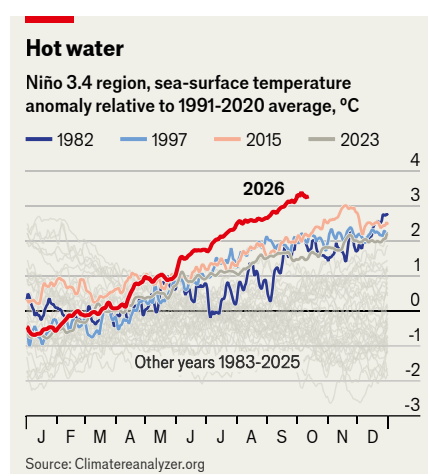
El Niño will generate effects beyond food and agriculture. The Asian Development Bank (ADB) warns it could worsen the energy shock: drying rivers cut hydro-power output just as heat raises demand for air-conditioning, pushing countries to burn more coal. Public health is at risk, too. Smoke from Indonesia's fires has shrouded large parts of South-East Asia; on October 12th Singapore's air was rated the unhealthiest in the world, worse even than Delhi's or Dhaka's.

The economic toll could be enormous, especially because governments are poorly placed to absorb it. A study of the 1997 El Niño found that it cost the global economy nearly \$6trn over the following five years—with Asia bearing much of the cost. The United Nations estimates that if this year's food-and-energy price shock were passed fully onto households (ie, if subsidies and other cushioning measures were removed), about 132m more people worldwide would fall into poverty, of whom 91m would be in Asia. As government debts balloon, avoiding this scenario will become harder.

The good news is that governments can see the crisis coming. Better data and forecasting mean policymakers are more prepared than in previous El Niño episodes, says Roshen Fernando of the ADB. Alongside building up rice buffers, governments are also trying to help farmers directly. India is nudging growers in parched districts to shift towards planting pulses and other crops; the Philippines, meanwhile, is handing out drought-resistant seeds.

Money needs to be arranged in advance, too. Disaster funds are often released only after disaster strikes. Governments should instead set aside money specifically for El Niño, says Mr Fernando. That could be done by negotiating emergency credit lines and disaster insurance before the peak arrives.

Particularly valuable is "anticipatory action", which releases cash or other help when forecasts cross predetermined thresholds (such as water levels in a reservoir). The UN thinks every dollar spent in this way can save up to \$7 in losses and later aid. Such schemes have been tried in Africa and Central America. But in Asia their coverage has been limited—owing to a lack



of financing. In June the UN's World Food Programme and its Food and Agriculture Organisation sought \$202m to protect 8.8m people in 22 countries, including Afghanistan, Pakistan and the Philippines. So far only \$40m has been raised.

More than a century ago a particularly intense El Niño caused famines that killed tens of millions of people across India, China and elsewhere. That was largely because nobody saw it coming or knew what to do. Today a far richer Asia knows what lies in store. But forecasts are only useful if governments and donors act on them. ■

Protest in India

Delhi under siege

DELHI

The government tries and fails to crush rallies for voting rights

MICROPHONES SHOVED in their faces, the youngsters raced to say their soundbites on democratic rights. Then the police went sped off with them still in mid-sentence. "That's the only way to protest now—we just go get detained," shrugged one. On October 10th in Delhi, drones filled the skies and tens of thousands of security men and women patrolled the strangely silent city below. India's capital witnessed its most sweeping crackdown on peaceful protest for many years.

After 12 years in power, Narendra Modi, India's prime minister, faces a challenge from Gen-Z protesters. In July the newly formed Cockroach Janta Party (CJP), a youth movement, staged mass protests against a corrupt exam system and poor job prospects, and eventually forced the education minister to resign. This time, the CJP is riding a wave of public anger against the voting system, which it says is rigged. The authorities are also better prepared.

As soon as the CJP's founder, Abhijeet Dipke, and his two lieutenants touched down at Delhi airport to lead the crowds at a planned rally, police arrived to snatch them away. While most of the roughly 5,000 detainees got out by nightfall, the Cockroach trio was held for 24 hours.

Central Delhi felt like a city under siege: borders sealed, internet jammed, 45 metro stations locked and loudspeakers blasting out warnings. Police bruised opposition leaders and briefly nabbed journalists and lawyers. Scattered protests emerged like flash mobs, only for baton-wielding officers to disperse them.

Though the Cockroaches were squashed over the weekend, India's opposition alliance, led by the Congress party's Rahul Gandhi, gathered tens of thousands for a march on October 12th. They, too, demanded that Gyanesh Kumar, the chief of India's Election Commission, resign; that the voter-verification drive he has managed must be scrapped; and that the law which, in effect, let Mr Modi hand-pick him should go. Over the past year, a "special intensive revision" of voter lists has deleted more than 130m names, many rightly, since they were duplicates or dead people. But very many wrongly.

The government, like the commission, denies the allegations. Kiren Rijiju, a BJP minister, calls the protests—which were refused police permission—a gimmick by those who keep losing elections. Batting away comparisons to the Emergency of the 1970s, when Indira Gandhi suspended democracy, he says: "This is not an emergency, this is normal law and order."

For India's long moribund opposition, the rallies against vote *chori* (theft) are about saving democracy and the republic. But the marches also express a more diffuse anger at years of perceived governmental missteps. Rally-goers raise shoddy schooling, jobless growth, women's safety, minority rights and unease at India's turn towards Hindu nationalism.

The upstart Cockroaches and India's established opposition have both vowed to protest until the election chief resigns. But Mr Kumar is virtually unsackable, because the prime minister stands by him, for now. And the authorities are doubling down. On October 14th Mr Dipke's two lieutenants were sentenced to five days in jail on trespassing charges. To Mr Dipke, the original Cockroach, the spectacle of the crackdown suggests the government has something to hide. "Narendra Modi and Amit Shah [the home minister] are waging a war on their countrymen just to save one Gyanesh Kumar," he says.

The opposition's bigger ambition concerns the national election of 2029. "People finally understand how the BJP is stealing elections," argues a close adviser to Rahul Gandhi. ■

Japanese demography

A tale of two towns

NANPORO AND YUBARI

Shrinking countries must move beyond one-sized solutions

LESS THAN 40km separates the towns of Nanporo and Yubari, on Japan's northernmost island of Hokkaido, but their fates could hardly have diverged further. Nanporo, a tranquil commuter town east of Sapporo, the regional capital, is growing its native population at one of the fastest rates in the country. Yubari, a former coal-mining hub that went bankrupt in 2007, has seen its population decline by 95% from its peak. Their contrasting trajectories offer lessons for local life in an era of demographic shrinkage.

Start in Nanporo. The town's population fell from around 10,000 in 1998 to fewer than 7,400 over the next quarter-century. But in recent years the trend has reversed: by last year, the population had ticked back up to 8,400. Nanporo was one of only nine out of 179 municipalities in Hokkaido to see population growth in 2020-25. It was the only one of those nine to do so without substantial foreign immigration. Meanwhile, Japan as a whole lost some 3m people over the same period.

A sense of optimism is palpable at the Hareppa indoor playground in the town's central park. Sunlight streams through the new building's floor-to-ceiling windows, lighting up a gaggle of children clambering up a wooden playhouse under a vaulted ceiling. In the adjoining café and library, a mum and young son peruse a shelf of children's books: "The Very Hungry Caterpillar", "Library Lion" and a popular Japanese series called "The Encyclopedia of Big Crises".

A combination of structural advantages and targeted policy initiatives has helped Nanporo solve its own big crisis. While offering the peaceful capaciousness of the countryside, the town sits comfortably within the economic orbit of Sapporo, less than an hour's drive away. Local leaders recognised that could appeal to young families, and implemented several incentives to attract them.

Many municipalities elsewhere in Japan have tried such measures, but Nanporo's have been effective because its efforts were sustained and unique, reckons Saito Takashi, an official. Couples where both partners are under 40 years old, or with children of middle school age or younger, can receive up to ¥2m (\$12,500) towards home construction; unused plots of land held in a prefectural land bank are sold at a steep discount. Parents also get 10kg of

rice every year, a meaningful treat when rice prices have caused national anxiety.

The Tatsuki family are among the new arrivals. Aoi and Yamato moved to Nanporo with their young son last year, drawn by the combination of proximity to Sapporo and support for young families. They built a home and opened a café on its ground floor, where they do brisk business serving lunch sets of grilled fish and freshly-baked desserts. "It would have been super-expensive to do the same in Sapporo," Mr Tatsuki says. After seeing the conditions, Mr Tatsuki's older sister decided to move to Nanporo as well.

Yet Nanporo's growth has come from migrants moving in, rather than a baby boom. Last year the town still saw twice as many deaths as births. With the national population shrinking, one municipality's gain is another's loss. There is a "competitive dynamic", Mr Saito acknowledges. Not everywhere can be Nanporo.

Many places will be more like Yubari. Its population peaked in 1960 at some 117,000. (Though the size of a town now, it still carries the city designation as a relic of its past glory.) After the last coal mine closed in 1990, Yubari tried to reinvent itself as a tourist destination; mismanagement left it bankrupt. As part of a nationally administered restructuring plan, officials closed schools, halted bus routes and shut the local museum. Cutting services only speeded the decline, laments Yubari's current mayor, Atsuya Tsukasa.

Since 2022, when Nanporo's tide began to turn, Yubari has seen its population shrink from around 7,000 to just 5,600. More than half the remaining residents are over 65. "Almost no one is moving in, everyone is leaving," says Noda Masaru, an entrepreneur. "And when you know the population is going down, you aren't going to

start a business, you're going to close it."

Yubari's case is extreme, but hardly unique. The Population Strategy Council, a group of business and civic leaders, reported in 2024 that some 40% of Japan's municipalities risk disappearing, given the outflow of young people. "I don't see any prospect for reversing the trend—it's not just Yubari, look at small towns across Japan," Mr Atsuya says. "The question is how to survive in that context."

While Nanporo, thanks to its favourable location near a regional hub, can realistically pursue revitalisation, for Yubari the task is to manage an inevitable further decline, for instance by becoming more compact. "We need to live in a more connected way," Mr Atsuya says. In an era of population shrinkage, growth can no longer be the only measure of success. ■

Myanmar

Charmless offensive

CHIANG MAI

Myanmar's dictator tries diplomacy

MIN AUNG HLAING is keen to get into the world's good books. The dictator, who seized power in Myanmar in 2021, underwent a makeover earlier this year. He quit the army and made himself president following a rigged election. Now he has gone on a diplomatic blitz within Asia and is talking to America. Calls to end military atrocities have gone unheeded; but the despot has some cards to play.

One is taking back those who have fled Myanmar's war and economic collapse. This won Mr Min Aung Hlaing a visit on October 7th-8th to Malaysia, formerly his biggest critic in the region. Anwar Ibrahim, Malaysia's prime minister, received him in return for a deal on repatriating thousands of Myanmar nationals, a bid to fend off local anger about the migrants.

Mr Anwar pleaded pragmatism, but the dictator's red-carpet welcome was a step towards his rehabilitation among leaders of the Association of South-East Asian Nations (ASEAN). The Malaysia visit followed ones in the past four months to Cambodia, Laos, Thailand and Vietnam.

Other cards include fighting online scams and selling rare earths. These have helped lure America into talks with the regime. Michael Vance, the State Department's intelligence chief, met Mr Min Aung Hlaing in September. Mr Vance's visit was ostensibly to secure the release from prison of Adam Castillo, a businessman. But the budding dialogue is focused on scam centres and extracting minerals. ►►



Mine shafted

▶ A rapprochement would be key to lessening Myanmar's reliance on China, which has propped up the regime amid its heavy losses to rebels. That help has come with high-handed orders to close scam centres targeting Chinese citizens. It is unlikely that America will have any more luck than China in getting them closed. Scam profits have allowed the centres to buy off regime officials, allegedly including the former head of its anti-scams committee.

Myanmar's rare-earth deposits, mean-

while, are largely beyond the regime's reach, in areas controlled by ethnic armed groups, and are locked into Chinese supply chains. American officials may simply be using the minerals to get noticed by Donald Trump. "Everyone knows the White House and president are fixated on rare earths," says a former Washington-based official with Myanmar experience. "That's what everyone, including me, would throw out in meetings to get attention."

Mr Min Aung Hlaing is also holding his

strongest card in reserve. The trading of Mr Castillo shows an appetite for hostage diplomacy—and there is one prisoner who far outranks the rest. Aung San Suu Kyi, who led Myanmar between 2016 and 2021, has been detained since the coup. If freed, odds are that she would be barred from politics. But her release might provide the symbolic win that ASEAN and others need to wash their hands of Myanmar's atrocious human-rights record and get back to business as usual. ■

ASHOKA *Home truths*

The limits of India's diaspora power

THE INDIAN diaspora, which numbers around 37m, is the world's biggest. It may also be the most successful. It has a compelling case to make, especially in America, home to more than 3m people born in India. The median Indian-American household earns \$151,000 annually, around 75% more than the figure for America as a whole. And many Indian-Americans occupy top jobs in business, technology and politics—think of Sundar Pichai, Satya Nadella, Zohran Mamdani and Kash Patel.

Such achievements are celebrated back in India, not just by relatives but also by a proud nation. Newspaper reports and WhatsApp forwards diligently catalogue the accomplishments of anyone with an Indian connection, however remote. Recent examples include Navi Pillay, the South African judge awarded this year's Nobel peace prize, whose ancestors left India in the 19th century, and Anil Menon, the world's first Malayali astronaut, a reference to his parents' origins in the south of India.

The state encourages such enthusiasm. For years after independence, India tended to look down on its diaspora, disparaging emigrants for deserting the homeland and contributing to a brain drain. But as their numbers grew and the economy boomed, the relationship changed. In the 2000s, during the Bharatiya Janata Party's (BJP) first term in power nationally, the party sought stronger ties with Indians abroad as a way of advancing India's interests and boosting its own coffers (overseas Indians are believed to be enthusiastic donors to the party). Under Narendra Modi, those efforts have become more intense. The prime minister's foreign trips often include rallies in stadiums packed with adoring non-resident Indians (NRIs).

To the BJP and indeed to many Indians, the success of NRIs is yet another indicator of India's inevitable rise. But, viewed differently, it is also an indictment of the country's inability to hold on to its talent. A study in 2023 found that of the 1,000 highest scorers in the 2010 entrance exam for the Indian Institutes of Technology, the country's top engineering colleges, 36% were living abroad eight years later. Among the top 100, the share was 62%.

Similarly, the accomplishments of Indian-origin bosses abroad reveal dysfunction at home. Given the size of India's economy, its businesses punch well below their weight. Of the world's 500 biggest firms by market capitalisation, India is home to only eight. China has 41, America 234. One reason is that many Indian companies, whether small or large, are run as "lala" operations, family fiefs lacking professional management. Another is that the state has failed to create the conditions—from infrastructure to regulation—needed for them to flourish.

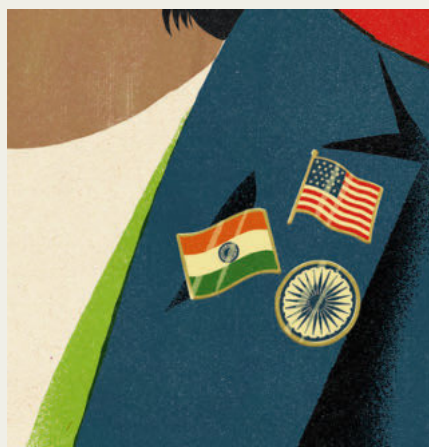
Emigration makes up for some of these

failures. Remittances amount to 4% of India's GDP (compared with 0.2% in China) and support millions of households. During crises, including the recent shock from the Iran war, diaspora cash has been particularly helpful. Migration has served as a social safety-valve, easing pressure on the labour market by giving educated Indians a chance of outward mobility.

It may now be shutting. The Trump administration has clamped down on migration. On October 8th it suspended tech firms, including several Indian ones, from sponsoring workers for permanent residency, accusing them of immigration fraud. Australia and Canada are restricting student visas. And it is not just potential migrants who are being targeted. Racism and resentment are fuelling hate campaigns on social media, especially in America.

The diaspora can do little to stem the hate, let alone advance India's interests. In America it has failed to persuade the Trump administration to adopt policies favourable to India. Indeed just last month Congress in Washington passed legislation allowing 100% tariffs on India for buying Russian oil. The diaspora may be large and even influential, but it is no diplomatic corps.

Mr Modi has hailed his overseas audience as *rashtradoot*, or emissaries of India. But for all their attachment to India, few in the diaspora want to return to a country where decent jobs are scarce and cities unliveable. Those are the same factors contributing to frustrations among youngsters in India who are increasingly expressing their anger on the streets. Celebrating success abroad may feel good, but a real reason for national pride would be for Indians to flourish at home.



China



Recycling

Trash to treasure

BEIJING

China's "circular" economy will help it secure supplies of critical minerals

THE EUROPEAN UNION worries about China's vast exports of cheap electric vehicles. On October 12th it said that in December a quota of 350,000 a year would be imposed on hybrid-EV imports from China. This is expected to keep their market share below 10%. But the bloc also frets about China's dominance over critical minerals used to make these vehicles.

A fast-growing number of EVs will soon be scrapped and replaced. Shredding their batteries yields "black mass", a powder from which valuable metals such as lithium, cobalt and nickel can be recovered and reused. From next month the EU will make it harder to export this waste. The aim is to encourage more processing of black mass close to home (currently most is shipped to Asia). In August America, which has banned Chinese EVs but still imports lots of Chinese batteries, blocked all black-mass exports.

China, however, is unlikely to suffer.

Black mass might meet 20-30% of global demand for battery metals by 2050, says the International Energy Agency, a forecaster. So China is supercharging its recycling industries to shore up supplies not just of battery metals, but also of rare earths and much else. The goal is to make the country's economy less "linear" (where raw materials are made into products that are then thrown away) and more "circular" (closing the loop so recycled waste replaces raw materials).

Once recycling efforts were driven by concerns about pollution. Now, amid a global scramble for the materials needed

to build a high-tech economy, security has become a primary motive.

The country has hard-earned experience in managing rubbish. It produces more than anywhere else: about 15% of the world's municipal detritus (everything from the contents of household bins to street sweepings) and more than one-quarter of its industrial waste (such as demolition debris, factory effluent, scrap metal, slag and ash).

In the 1980s China started to import waste, taking the hardware, paper and plastic that richer countries did not want. A sprawling informal recycling sector emerged, led by scavengers picking through rubbish piles. Much ended up in landfills or burnt in the open air, leaching toxic chemicals and creating poisonous smog. A Chinese documentary in 2011 found that organic waste from dumps around Beijing was being turned into oil and sold to restaurants.

In 2013, wary of mounting public anger, China declared a "war on pollution" and released its first comprehensive national plan to create a circular economy. Electronics were directed to new "urban mining" zones to be scrapped safely; household rubbish was sent to specialised plants to be burned for power; the proportion of waste dumped in landfills started to fall. In 2017 China launched "Operation National

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► Sword” to stop most imports of plastics (in 2021 all imports of solid waste were banned). State-run media trumpeted that the country was “no longer a dumping ground”. Over the past five years most of China’s cities have rolled out mandatory sorting of household rubbish.

China is still well behind squeaky-clean European countries when it comes to waste management (though it is hard to say how far, as it does not publish detailed national data for recycling). Its poorer rural areas are still often strewn with rubbish. But officials have made China’s big cities, at least, cleaner and more pleasant to live in. Now their focus is shifting to the use of recycling for the sake of security. In July China released a plan for the development of the circular economy until 2030. “The importance of resource security has become increasingly prominent, while geopolitical dynamics...have grown complex and severe,” the plan noted.

That judgment rests on two considerations. First, China wants to dominate high-tech manufacturing in everything from robotics to wind turbines (see next story). And second, to achieve this, it must secure supplies of raw materials, connect more power lines and build more data centres. Massive amounts of aluminium, copper, battery metals and rare earths are needed. While China controls the bulk of the global refining capacity for these materials, it relies on imports for most of the ores. Meanwhile many Western countries want to reduce reliance on China’s factories. Officials worry they may try to squeeze its supplies. Last year a researcher at a state-owned research facility said that, without recycling, China would “keep facing strangleholds in the future”.

China wants to use recycling to supply 510m tonnes of industrial materials annually by 2030, about one-third more than the current level. The easier part will be scaling up the recycling of steel, copper and aluminium: this kind of work is already a mature industry. Recycling more plastic is a little trickier, but worth it to help China reduce imports of oil. The hardest bit will be managing a growing tsunami of electronic garbage. By 2030 China expects to generate 0.5m tonnes of waste from wind turbines, 1m tonnes from EV batteries and 1.5-2m tonnes from solar panels every year—big shares of the global total.

The fact that China already makes vast quantities of these goods should make recycling simpler. Factories can tweak designs so that products are easier to dismantle later. And many battery-producing techniques (such as using acids and heat to isolate valuable metals) are also used in recycling them. Take CATL, for example, the world’s largest battery-maker. Most of the Chinese firm’s sales are domestic, and will end up being processed by a CATL subsid-

iary called Brunp, which is the world’s biggest battery-recycler. Such arrangements have helped China build 85% of global battery-recycling capacity.

Still, big challenges remain. Much of China’s recycling capacity is unused because too many batteries end up with informal scrap dealers (who waste much of the good stuff inside them) or are just dumped. In recent years several gangs have been busted for running illegal battery-collection rings. Solar panels and wind turbines, which are often used in remote parts of the country, present an even bigger collection problem. Valuable materials they contain (silver, for solar panels; and neodymium, a rare earth, for wind turbines) are present only in small quantities, making extraction trickier.

As ever, China hopes its tech-enabled state can overcome such difficulties. In 2024 it set up a new state-owned company called China Resources Recycling Group to co-ordinate and streamline recycling efforts, with a focus on cleantech products. Recycling plants have started using artificial intelligence to sort waste more efficiently. In April battery- and EV-makers were required to give their products digital IDs to track them through their life cycle on a state-run platform. They have also been made legally responsible for recycling the batteries they produce.

China says recycling already accounts for 10% of its supply of rare earths. It is trying to make the process more efficient. At present it is far more costly than extracting them from raw materials. Still, Chinese rare-earth companies, which are almost all state-owned, “do not rely on economic viability in all cases”, notes Corby Anderson of the Colorado School of Mines.

And to make sure its recycling plants are fed, China is also quietly reassuming its old role in the waste trade. It is selectively rolling back restrictions on some foreign waste. In 2024 it eased curbs on imports of some scrap copper and aluminium. Last year it started allowing imports of black mass. In January it slashed duties on the stuff from 6.5% to 3%. Officials have pledged to continue to increase imports of “high-quality” recycled materials over the next five years.

Now that America and Europe want to keep their valuable waste, could they eat into China’s recycling dominance? Zhang Yuping, the deputy general manager of GEM, a big Shenzhen-listed battery-recycler, thinks not. “From the perspective of national security, they might have some justification,” he says. But the cost of recycling outside China would be high and scaling up difficult. Europe, at least, “can’t digest” such a challenge, reckons Mr Zhang. “They would pay a heavy cost.” ■

Industrial policy

Old mould, new machines

China has captured a big share of the market for 3D printers. The West is wary

THE FASTEST-GROWING industrial product in China today is not the electric vehicle, lithium-ion battery or even humanoid robot. It is the humble 3D printer for hobbyists. Once geeky curios, 3D printers have quietly become one of China’s most successful consumer electronics. Exports of the machines grew by 90% in the first half of this year. In the past decade China’s global market share has risen from 19% to 96%, ending the dominance of Western firms.

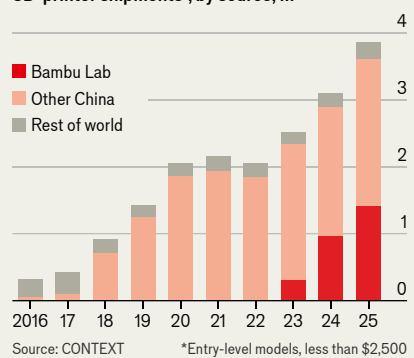
The personal 3D-printing market is now split among the “four little dragons of Shenzhen”, says Chris Connery of Context, a London-based market-intelligence firm. Creality, Anycubic, Elegoo and the industry’s leader, Bambu Lab, reign supreme globally (see chart). Their success shows, yet again, how fierce competition in China combined with generous government support can help improve quality and drive down export prices, making Chinese pro-

ducts hard to beat.

The printers work by building objects layer by layer, usually by extruding molten plastic. Invented by Chuck Hull, an American, in 1983, they long remained expen- ►►

Bambu shoots

3D-printer shipments*, by source, m



► sive, unreliable and difficult to use. Today they routinely sell for a little more than \$500 and have the sleek aluminium finish of an Apple computer. Comparable entry-level printers from Western firms start at more than double the price. Artificial intelligence allows users to create print designs for such things as tools, parts or toys by describing them in natural language rather than using complicated design-software. Just as Chinese factories helped to turn drones into recreational devices (as well as game-changers in warfare) by achieving large-scale production at low cost, so they are now doing with 3D printers.

Price wars have eaten into the printer dragons' profits even as sales boom. But the firms still excite investors. Bambu Lab was founded in 2020 by alumni of another Chinese company, DJI, the world's leading dronemaker. The printer-maker is reported to have a private valuation of about \$10bn. Last year DJI itself invested in Elegoo, a Bambu rival. Creality listed on the Hong Kong Stock Exchange in May. It boasts a market capitalisation of HK\$12bn (\$1.5bn).

The government cherishes 3D-printing firms. The business featured in its "Made in China 2025" industrial plan, which was launched in 2015 to ensure domestic strength and self-reliance in high-tech manufacturing (much to the West's concern). Officials see 3D printers as a way to produce components of aerospace, health care and military equipment, for which China often relies on Western suppliers. Policymakers have directed research institutes and state-run firms to buy them.

Some competitors say Chinese firms have profited from Western open-source printing software. Last month an American court ruled that Bambu Lab had infringed on four patents held by an American company, and ordered it to pay \$27.6m in damages. Although Chinese firms have captured the consumer market, they have struggled to do so for industrial 3D printers. Firms are wary of relying on Chinese products if it involves feeding them with sensitive designs (though Britain's defence ministry has been using Bambu printers, its government admits). Outside China, top-of-the-range machines are still mostly supplied by American and European outfits. They can sell for millions of dollars.

Undeterred, Chinese suppliers are creating a new form of manufacturing at home and abroad. They are pioneering "3D-printing farms"—facilities with as many as 5,000 desktop 3D printers that operate like factories. Several have been built in China this year. Printing farms can mass-produce trinkets for zany consumer trends in short order, replacing expensive and slow injection-moulding techniques. Like the printers themselves, their output will be higher quality and cheaper than what came before. ■

Overseas aid

Up in alms

China is giving more to multilateral development, but cautiously

CHINESE DIPLOMATS often talk about the threat of a "Thucydides trap", named after the Greek historian who described how an incumbent power, Sparta, fought to resist the rise of an upstart, Athens. In the realm of foreign aid, however, such fierce rivalry has been sadly absent in recent years. Another trap, identified by Charles Kindleberger, an economic historian, looks dangerous, too. He described what happens when a stabilising superpower cedes its global role before the emerging power is ready or willing to assume it. America was slow to fill Britain's shoes in the interwar years of the 20th century. And there is now a similar gap in the realm of multilateral giving.

America has tired of the international institutions it helped create. Last year the aid it channelled through multilateral organisations like the World Bank and the UN fell by half. It has withdrawn from the UN's World Health Organisation—and it still owes the WHO money.

China could have rushed boldly into this void. And it has indeed stumped up more cash. But its approach lacks Athenian assertiveness. "China is not currently either willing or able to fill the financial gap that would be left behind by US withdrawal," points out Beata Cichocka of the Centre for Global Development, a think-tank in Washington.

With her colleague Ian Mitchell she has tried to add up China's contributions to multilateral aid, channelled through development banks, UN agencies and 26 "vertical" funds that collect money for specific

problems such as climate change. China itself founded some of these institutions, including the Asian Infrastructure Investment Bank, based in Beijing, and the New Development Bank in Shanghai.

China's giving to these bodies has increased steeply over the past decade, from about \$1bn in 2014 to more than \$3bn in 2024 (see chart). China has, for example, become the largest donor to the WHO among its member states, promising an extra \$500m over five years. It has backed Song Li, a Chinese health official, to become the organisation's boss when the position opens up next year.

China has also pledged more money to the International Development Association, a World Bank outfit that provides aid and cheap loans to 78 of the world's poorest countries. China was itself once one of those hard-up countries, receiving almost \$10bn in soft loans from 1981 until it ceased to be eligible in 1999. China's "transformation from major borrower to significant donor represents one of the most remarkable trajectories in multilateral development finance", as the report points out.

This transformation is all the more welcome given the remarkable retreat of other donors. But much of China's extra multilateral giving is mandatory, not voluntary: it must pay more dues because of its economic growth. Even the \$500m pledged to the WHO mostly reflects an increase in membership dues, judging by the patchy information available. China is doing its bit. But it is not going far beyond its duty.

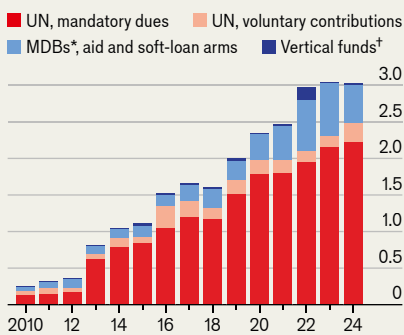
Perhaps this should not be a surprise. China's GDP per person is still middling by world standards. It has only just reached the income threshold at which countries typically "step up their contributions", points out Mr Mitchell. And China's increased giving has not been matched by a comparable increase in voting power or voice within the institutions it finances. China's government is "seized [by] this feeling that they pay and therefore they should have [a] say," says Courtney Fung of Macquarie University. Its voting share in the World Bank remains at less than 6%. According to formulas the bank has used in the past, it should be more than 12%.

China's share of UN staff is also tiny: 1.4%, ranking only 20th. It is trying to change that by funding more junior professionals and other entrants. China contributed 773 interns in 2022-23 compared with America's 532. But the country's civil servants still struggle with language barriers and unfamiliar work habits.

Some obstacles are self-imposed. China, for example, screens its candidates for patriotism (which includes political loyalty). And civil servants who have spent too long abroad worry that their home networks are "going stale", says Ms Fung. Perhaps the Athenians felt the same way. ■

And the voice to match?

China, contributions to multilateral institutions focused on health and development, \$bn



Source: Centre for Global Development *Multilateral development banks †Earmarked for specific development issues

CHAGUAN

Bills before rights

China's taxpayers now owe more. Is more owed to taxpayers?



AMONG TAX evaders, from Al Capone to Cristiano Ronaldo, Wu Huatao hardly stands out. Still, the small-time salesman deserves recognition for his brazenness. According to Shanghai's tax bureau, Mr Wu earned about 550,000 yuan (\$82,000) per year but reported just 9,000 yuan. He also claimed an exemption as an ocean-going seafarer when he was, in fact, a landlubber. Then, when tax officials called him, he blocked their numbers.

The authorities ultimately got their man. After they had subjected Mr Wu to what they caringly described as "face-to-face education" on income-tax policy, he fessed up to his misdeeds and paid his taxes and fines. This is just one of many similar cases as China cracks down on evasion. A big deadline looms on October 22nd, when wealthy Chinese must comply with a new tax on offshore trusts or face penalties for late payment.

The heightened enthusiasm for tax collection naturally raises economic questions. Does it reflect a state that is strapped for cash? Probably. Extra revenue is needed to plug gaping budget holes. Might the rules spook Chinese investors? Possibly. But many are captive in their home market. Who will benefit most? That is easy: tax advisers.

Yet there is a separate, more combustible angle to consider: whether the Communist Party faces any political risk from pushing too hard on taxation. No one is throwing green tea into Ningbo's harbour for now. But Chinese taxpayers, like those anywhere, want to know that the government is not wasteful. And demands for budget accountability are discomfiting for a regime allergic to popular representation. So the trick for Chinese officials is to ensure that cash flows into state coffers without prompting people to dwell on their putative rights as taxpayers.

China's fiscal system has long been calibrated to do just that. Personal income tax is equivalent to about 1% of GDP, compared with an 8% average in rich countries. Thresholds are so high that only 65m people—a tenth of the workforce—pay any at all. China makes up for this partly with indirect taxation, especially a value-added tax (VAT) that is baked into prices for consumers. It also has non-tax revenues, mainly from land sales. Taken together, these let China extract resources so thinly that people do not feel the

pinch. Zhang Changdong of Peking University has argued that the vast majority do not know what they pay in taxes—blissful ignorance as far as the party is concerned.

Yet the system has flaws. When consumption taxes are relied on so heavily, they hit poor people hard because the less well-off spend a bigger share of their incomes. The wealthy technically face much higher income taxes but have many loopholes to reduce their bills—including, until recently, offshore trusts. More pressing for the government, the tax structure no longer raises enough revenue. Local authorities, which had relied on land sales for much of their income, now face widening budget deficits amid a prolonged property slump.

That is what makes the new taxation drive so significant. Previously officials went after the odd celebrity, such as Fan Bingbing, an actress ordered to pay a whopping 883m yuan in 2018, to show that the wealthy are not a law unto themselves. Now China's taxation efforts are much broader. Virtually every transaction is digital, and authorities have honed their technology for parsing the data—a system known as Golden Tax Phase IV. They comb through bank statements and transactions on Alipay and WeChat, China's main digital wallets. All this monitoring is buttressed by co-operation with tax agencies in many other countries.

Over the past year people with foreign accounts have received alerts in their income-tax apps warning them to comply with laws. The ultra-rich could owe mammoth sums, enough to unsettle financial markets. Shu Ping, a co-founder of Haidilao, a hotpot chain, sold a nearly 5% stake in September, worth about HK\$2.75bn (\$350m). The firm cited personal funding needs; analysts suspected a tax bill. Haidilao's share price fell by more than 10%. Other bosses—especially those whose foreign listings suggest wealth offshore—may also be in line for hefty back taxes.

Read my lips

A private-equity manager recently moaned to Chaguan that his tax bill had blindsided him. The government's new rule on overseas trusts did not exempt existing arrangements; it had applied the tax retroactively. But he had to resign himself to paying up. The government is counting on a couple of things. The rich do not really have anywhere to run, short of changing their citizenship and abandoning their businesses and assets in China. And most of the population will remain untouched, and indeed might enjoy seeing more fortunate compatriots pay up.

Yet Mr Wu, the hapless tax-evading salesman, is a reminder that the dragnet does not stop at tycoons. Anyone with side income or a foreign brokerage account is now visible to tax authorities. That describes many middle-class Chinese, precisely those who are likely to wonder what they are getting in return. In the early 2000s state media occasionally spoke approvingly of "taxpayer consciousness"—the idea that those paying taxes ought to have some oversight of public budgets. Such talk has faded as the state has tightened its grip on the media. Instead of taxpayers' rights, the emphasis has been on their duties. Beijing's tax office recently listed managing public sentiment as a key part of the new reforms—a euphemism for nipping criticism in the bud.

Fiscally, a shift to more direct taxation is right for China, promising a system that is fairer and more sustainable. Politically, it is a calculated gamble. China is making the taxman a bigger, and more intrusive, presence in everyday life. People who pay more tend to ask for more. ■

Middle East & Africa



Saudi Arabia and the Houthis

War comes home

RIYADH

Yemen's rebels wager the kingdom has more to lose than they do

SINCE 2014, when Yemen tipped into civil war, the country has become one of the most desperate places on earth. GDP per person has fallen by 58%. Most families cannot survive without foreign aid. More than 2m children under five are malnourished. Yet the Houthis, the Iran-backed rebels who are one side of the conflict, fight on. They care little about governing and extort enough money from areas they control to keep their war machine humming.

Now they are wagering that Saudi Arabia, which supports their opponents, will have far less tolerance for pain. For weeks the Houthis have escalated attacks on Saudi infrastructure. Strikes on Riyadh's airport have halted flights to the Saudi capital. On October 13th the Houthis attacked the headquarters of Saudi Aramco, the state-run oil giant, in the eastern city of Dhahran. The kingdom feels under siege, just as it prepares to host its flagship investment conference this month.

In public, officials have tried to sound defiant. "The word fear, in the Saudi dictionary, does not exist," the energy minister told a gathering of oil executives this week. But the Saudis have no good options. They will struggle to defeat the Houthis, and a long war will upend plans to diversify their economy and to make Riyadh a hub for finance and tourism. Yet the alternative is to cut a costly deal that invites, rather than deters, future Houthi threats.

The rebels seized most of Yemen's population centres in 2014 and still hold them, despite a Saudi-led invasion the next year

meant to drive them from power. A ceasefire in 2022 froze the front lines, but the wider Gulf war that America and Israel began in February made the truce unsustainable. By summer both sides were preparing for renewed fighting. Last month the Houthis launched an offensive that saw them seize much of Yemen's south-western coast, including the port city of Mokha (see map on next page).

The Saudis and their Yemeni allies began a counter-offensive this month. Progress has been slow. They have recaptured a strip of the coast, but for now they seem to have halted around the town of Dhubab, 40km south of Mokha. Typically in Yemen, campaigns start strong but soon grind into stalemate. Meanwhile, the Houthis are still trying to encircle Taiz, Yemen's third-largest city and an anti-Houthi redoubt.

They have also resumed cross-border attacks on Saudi Arabia. Airports have been a particular target, with four deadly strikes on the capital's airport in a single week. The worst came on October 10th, when missiles hit Terminal 3, which handles domestic flights. They killed 13 people and injured more than 300. Some of the casualties were pilgrims boarding a flight to Jeddah, the gateway to Islam's holiest sites.

It is unclear why the Saudis were unable to intercept the missiles. They have advanced air-defence systems, including ►►

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▶ American-made THAAD and Patriot batteries. Like many other countries in the region, however, they are concerned about dwindling supplies of interceptors after almost eight months of war. The Houthis have also started to employ multi-layered attacks, using a mix of drones and missiles to overwhelm defenders. It did not help that the Saudis recently disabled the mobile-phone alerts that warn of incoming fire, apparently because too many locals found them disruptive (they were reinstated after the airport attack).

Riyadh's airport is shut until at least October 18th. Though others are open, flights to Jeddah and Dammam are routinely put in hours-long holding patterns, which suggests ongoing Houthi attacks there as well. Many foreign carriers have cancelled flights to the kingdom. Europe's aviation-safety agency has urged airlines to avoid a big part of Saudi airspace.

All this has disrupted what should be a busy time in the kingdom. October 11th was the start of the World Petroleum Congress, an energy summit hosted this year in Riyadh. The bosses of several big oil firms cancelled their attendance. Organisers still hope to go ahead with the Future Investment Initiative, which begins on October 26th. The annual event, organised by the crown prince, Muhammad bin Salman, and often dubbed Davos in the desert, usually draws a who's who of global finance. But it is likely to become a "hybrid" event, with many guests joining remotely.

This is Saudi Arabia's underlying dilemma in Yemen: its government has far more to lose than the battle-hardened Houthis. War will disrupt Vision 2030, Prince Muhammad's effort to overhaul the economy. Last year the Saudi sovereign-wealth fund inaugurated a new airline, Riyadh Air, hoping to compete with Gulf super-carriers such as Emirates. Its planes were quietly moved out of Riyadh this week for safe keeping. Employees in the capital's financial district have been told to work remotely until further notice.

I knew you were trouble

Nor does war seem likely to succeed. The Saudis insist they are fighting in Yemen on behalf of its internationally recognised government, which is technically true: the UN does not recognise the Houthis as legitimate rulers. But it is also something of a fiction, because the government is a husk. The president, Rashad al-Alimi, was installed in 2022 as part of a shake-up engineered by the Saudis. Ministers spend much of their time in Riyadh.

Yemen's army exists in name only. Since 2015 the anti-Houthi forces have been a motley crew of militias, from Islamists to tribes to separatists who seek an independent south Yemen (as it was until 1990). Some were sponsored by Saudi Arabia,



others by the United Arab Emirates (UAE). The latter were widely regarded as more effective, in part because the UAE was willing to embed special-forces units on the front lines to train and advise its proxies. The Saudis preferred to manage from afar.

But the Gulf powers fell out last year after Emirati-backed separatists seized a chunk of territory from the Saudi-supported camp. The UAE was forced to withdraw its forces, leaving the Saudis to run the war without their most capable ally. The results have been lamentable. As the Houthis ad-

vanced on Mokha, their foes fled. If the Saudis continue to wage war remotely, better results are unlikely.

They are eager for outside help. Saudi Arabia has invoked its mutual-defence pact with Pakistan and Turkey. The former has sent thousands of troops but insists they will not fight in Yemen. Prince Muhammad has asked Donald Trump to order American air strikes (so far, the president has demurred). Air power alone will not defeat the Houthis, however: after all, since 2024 they have been bombed by America, Britain, Israel and Saudi Arabia.

The other path is diplomacy. Since 2022 the Saudis have tried repeatedly to reach a deal with the Houthis. Whenever they seem close, the rebels add further demands. Now the Houthis feel they have the upper hand. Their terms will be steep: the Saudis would probably have to stump up billions of dollars and recognise Houthi rule in Yemen. Officials in Riyadh also worry, rightly, that making big concessions now will embolden the rebels to make fresh demands in the future.

Several people who have recently met Saudi leaders believe they will attempt to split the difference: try to retake Mokha, then sue for peace. But the Houthis get a vote too. If they manage to conquer Taiz while pummeling Riyadh with missiles, they may not feel compelled to stop. ■

Israel's Arabs

The missing link

JERUSALEM

Israel's Arab parties are keen to help dump the government. Will Jewish ones let them?

IN A CAMPAIGN VIDEO released on October 10th Yousef Jabareen, leader of the Joint List, a slate of candidates from three predominantly Arab-Israeli parties, made a striking announcement. The bloc would "use all the tools" at its disposal to replace the government and "serve as a safety net" for the opposition. For most of Israel's history, they have stayed on the sidelines, in opposition. But this year, for the first time in an Israeli election, all the parties representing Israel's Palestinian citizens have vowed to try to change the government.

"This is an existential election for Jews and Arabs," says Ahmed Tibi, head of the Arab Movement for Change, one of the parties in the Joint List. "The levels of racism and incitement from this fascist government are simply too great. We'll do almost anything to kick them out." This should mean Binyamin Netanyahu and his allies can be beaten. *The Economist's* poll tracker has his opponents, Jewish and

Arab, together averaging 64 seats in the 120-seat Knesset, Israel's parliament. And yet the Arab parties remain unwelcome.

For decades the parties representing Arab voters, who make up around 20% of the electorate, stayed outside the post-election coalition wrangling. But since the 1980s they have endorsed candidates for prime minister and in 1992, they formed a de facto bloc with centre-left parties to prevent the right-wing Likud party from forming a coalition. In 2021 Ra'am, a small conservative-Islamist party broke away from the Joint List, insisting it wanted to go further, and that it would join any government in which it could have some influence on behalf of Arab voters.

In that year's election Ra'am passed the electoral threshold of 3.25% of the vote on its own, winning seats in the Knesset. Ra'am's leader, Mansour Abbas, held talks with Mr Netanyahu about joining his government. Mr Netanyahu's far-right allies ▶▶

► scuppered that plan. But weeks later Ra'am became the first independent Arab party to join a coalition when it voted in favour of a short-lived government formed by Naftali Bennett. In the next year's poll, Ra'am did even better.

The Joint List, which in 2021 broke with Ra'am because of Mr Abbas' willingness to consider joining a coalition, is now following its lead. Yousef Makladeh, who runs the Statnet Research Institute, says that in his polls "the overwhelming majority of Arab voters put replacing the government and fighting the crime wave in our communities above all other issues, including the war in Gaza and solving the Israel-Palestinian conflict." Crime-related murders in Arab communities have doubled during the four years of the current government. Many among them blame the far-right national-security minister, Itamar Ben-Gvir, accusing him of intentionally diverting policing resources away from their towns.

Ra'am has put a prominent Jewish politician, Yoav Segalovich, a former police commander, on its list. They hope he will boost their crime-fighting credentials as well as increase their appeal to non-Arab voters. The Joint List reckons this is going too far. "Unlike Ra'am, we have conditions, such as a future diplomatic process with the Palestinians," says one Joint List campaigner. But, he concedes, "a vague commitment will be enough."

Among Israel's Palestinians 77% say an Arab party should join the country's government, according to the Moshe Dayan Centre at Tel Aviv University. And yet among the four main opposition parties only the left-leaning Democrats openly favour an alliance with them. Yisrael Beiteinu (Israel Our Home), a nationalist party, is firmly opposed. Gadi Eisenkot, Mr Netanyahu's main challenger, and Mr Bennett, a former prime minister, who lead the two big centre-right parties, are evasive. Mr Netanyahu's campaign has accused them of planning to form a government with Israel's Arabs. Their equivocation reflects their fear that such accusations will be electorally damaging. Since October 7th and the war in Gaza, attitudes among Jewish Israelis towards Palestinians have hardened. According to one poll, a majority of Israelis support barring the Arab parties from even running. The Knesset's electoral commission tried to disqualify them (the Supreme Court blocked the efforts).

Even if they do not formally join a coalition, the Arab parties could still support a minority government led by Mr Eisenkot, in a confidence-and-supply deal. "There are a lot of things we could do together without joining the government," says Mr Tibi, though he insists there have been no talks so far with Mr Eisenkot or his party. "There will be time after the election. Why give Netanyahu ammunition?" ■

Israel's elections

Flying visits

Israelis abroad are flocking home to vote. Many have an axe to grind

ROI SARIG is about as Israeli as it is possible to be in London. Born on a kibbutz to a family with roots predating the country's independence, which he celebrates each year, he follows its news and politics closely, visits regularly and plans to return some day. Yet in the 22 years he has lived in Britain, his wife's home country, he has not once voted in an Israeli election. "It was never a case of me detaching myself from my Israeli identity," he says. "But I believed that because I wasn't living there it wouldn't be right for me to cast my vote." This year, however, he will be flying back to do exactly that on October 27th.

He is far from alone. Across Israel's wide diaspora, the talk around dinner tables and in synagogues in recent weeks has been about who is going home to vote. Under Israeli electoral law only a few limited categories of citizens and their families, such as diplomats and employees of the Jewish Agency, the main body responsible for promoting *aliyah*—Jewish immigration—can cast their ballots in embassies abroad. Apart from Israelis living in the occupied territories of the West Bank, everyone else must return to Israel if they wish to exercise their democratic right.

It is impossible to know how many will go but numbers appear to be unprecedented. The Aid Coalition, an Amer-

ican non-profit group focused on promoting democracy in Israel, expects over 50,000 expats in America to go back.

The election may be close. Our poll tracker suggests that the Likud party of Binyamin Netanyahu is neck-and-neck with Yashar, a new party led by Gadi Eisenkot. Dahlia Scheindlin, a political strategist and pollster, reckons this year each 40,000 votes a party wins could translate into one of the 120 seats in the Knesset, Israel's parliament. (The number varies depending on turnout and the party's vote share.) No one knows how expats will vote, but it is reasonable to assume they will lean heavily to parties opposing Likud because "the major efforts to help people come back are mostly among liberal circles," she says.

Many returning were involved in protests against Mr Netanyahu's judicial reforms in 2023, which they saw as attacks on Israel's democracy. The government's failures to prevent the Hamas attacks on October 7th 2023, and its prosecution of war in Gaza have added to their anger. "For Israelis abroad it has been like watching a slow-motion car crash," says Jenny Kananov, an Israeli co-founder of We Democracy, a network in Britain that supported Israel's pro-democracy movement. "Some people feel this is the last chance to somehow try to make things right."



Boarding passes and ballot papers

African-EU trade

The green squeeze

NAIROBI

Africa is being punished as a result of Europe's efforts to mitigate climate change

MASAI FARM near Nairobi, Kenya's capital, is arguably as green as they come. The temperature in its greenhouses is set by natural ventilation. Their proximity to the equator means the flowers get 12 hours of sunshine every day of the year, so artificial light is unnecessary. Any carbon emissions are tracked and reported, says Vincent Terer, the farm manager.

And yet green-minded policymakers in Europe are unimpressed. Each night seven to 18 tonnes of its flowers are flown out of Nairobi, over half on the 6,400km journey to the Netherlands. This puts them in the sights of retailers in Britain and Europe seeking to cut their carbon footprints. Some European supermarkets and food companies have of late banned, or said they plan to restrict, air freight from their fresh-produce supply chains. Some are switching from east Africa to places like Morocco, which can send exports by sea.

Low-carbon African exporters like those in Kenya's blooming cut-flower industry contribute next to nothing to climate change. Africa has 18% of the world's population but is responsible for less than 4% of historic carbon-dioxide emissions. Yet it is especially exposed to what Jodie Keane of ODI, a think-tank in London, calls a "green squeeze": rising costs and shrinking market access as richer countries adopt measures to decarbonise global supply chains. Between 1997 and 2021 the share of trade measures relating to environmental concerns notified to the World Trade Organisation rose from 8% to 19%. Those most heavily burdened include Africa's small businesses and farms that risk losing vital trade as the effects of climate change start to be felt.

The carbon footprint of sunlit Kenyan flowers is smaller than those grown in heated European greenhouses in winter. East African flower and fruit exports often go as bellyhold cargo in scheduled passenger flights, adding only marginal emissions. Still, "the public has a visceral reaction to aeroplanes which they don't have to greenhouses," says David Beer of TradeMark Africa, a non-profit group in Nairobi.

A more immediate crunch for the continent's exporters is coming in the form of regulation. The EU's new deforestation rules, which require importers to prove that their cocoa, coffee, rubber, soya, palm oil, wood or cattle products were not produced on land that was forest before 2021,



are due to take effect in December. African exporters face losing market access if they cannot provide adequate evidence.

After months of wrangling and two missed deadlines, the final rules have been eased a little. But countries such as Ethiopia, where many farmers grow coffee on tiny plots, are still not ready for the changes, says Ms Keane. She and her colleagues at ODI estimate that Ethiopia could lose almost two-thirds of its coffee exports to the EU, even though just 20 coffee plots have so far been linked to deforestation since 2020. Last year the bloc bought \$765m of the country's \$2.65bn of coffee exports.

Another big worry is the carbon border

adjustment mechanism (CBAM), a levy on imports of certain industrial commodities, such as aluminium and steel. The scheme, which took effect in January, is meant to help clean up global supply chains by making foreign suppliers pay the same carbon price as European ones. Africa's renewable-energy resources could give many of its exporters an edge. But African production of most commodities under the scheme is, on average, more carbon-intensive than that of rivals. And no African country outside South Africa yet prices carbon, so exporters pay the full EU price with no deduction for a levy paid at home.

African businesses and policymakers fear a ratchet, as measures like CBAM expand to cover more products, and other countries follow suit. "We are beginning to see a new form of standard emerge," says David Luke of the London School of Economics (LSE), so global export competitiveness will increasingly depend on verified carbon performance as well as quality and price. Countries without strong systems for monitoring and verification—ie, most African ones—will lose out. The African Climate Foundation and the Firoz Lalji Institute at LSE estimate that if the scheme expands to cover all imported goods, African exports to the EU could shrink by 6%.

Some African exporters are seeking alternative markets. "We've got the Middle East, we've got India, we've got the Far East," says Tiku Shah, the boss of Sunripe, a Kenyan fresh-produce firm. "They don't have these standards." Kenya's exports of avocados to China surged by over 60% in the first half of 2026. Yet China has its own non-tariff barriers, such as tough phytosanitary rules. And buyers in the Middle East offer unpredictable prices and, at times, fail to pay, notes Wester Schepers of COLEAD, a non-profit that helps African



Picking her battles

► farmers meet European standards.

Many firms therefore have little choice but to adapt. For some less perishable produce such as avocados, sea freight—which can emit up to 85% less carbon dioxide per tonne than air freight—is a viable alternative. TradeMark Africa is helping to introduce electric lorries in Ethiopia, partly in case CBAM expands one day to cover transport as well as production. Sian Flowers, the Kenyan firm that owns Masai Farm, is responding to demands from buyers for more precise carbon accounting by building models to estimate emissions from the airport all the way to the final destination.

The EU could do more to help. Robert

Byaruhanga of the Uganda Coffee Federation, an industry body, argues that the EU and the bloc's coffee roasters should share the cost of complying with EU deforestation rules. The requirement for rich countries to do more to decarbonise than poor ones, laid out in the COP21 Paris climate-change agreement, should mean African exporters pay lower carbon prices under CBAM. Fatan Agged of the African Futures Policy Hub calls for Africa to set up establish its own trade decarbonisation fund. Africa needs to “really start investing in this adjustment”, she says. The EU buys almost a third of Africa's exports. That trade partnership is too valuable to squander. ■

Kenya's election

#getoutthevote

NAIROBI

Gen-Z Kenyans could determine William Ruto's future

AT THE START of this year Allans Ademba, a 26-year-old Kenyan photojournalist, was despondent. A mass uprising against William Ruto, Kenya's president, which began in 2024 seemed to be fizzling. Protesters' main goal—that the beleaguered Mr Ruto should serve just one term or less—looked remote. After years of falling living standards, “most people were very politically conscious,” Mr Ademba recalls. Yet in the general election in 2027, “nobody was registering” to vote.

A few months later the mood is strikingly different. In March Mr Ademba launched “Niko Kadi”, or “I have my card” in Sheng, the local Swahili-English slang. The viral campaign seeks to get millions of young Kenyans voting in 2027 for the first time. Mr Ademba and his fellow Gen-Z organisers helped register 2.6m new voters in a single two-week period this year (22m people could vote in the last election). Now they are preparing an even more ambitious mass registration drive: enlisting young Kenyans not only to vote but to run for office. The impact on what is expected to be a vicious election could be decisive.

Niko Kadi blends modern online campaigning with more traditional get-out-the-vote efforts. The movement began on social media, notably on TikTok, where activists post cheery videos urging fellow youngsters to collect their voter ID cards. Alongside practical advice, such as where and how to register, are jokier tips, such as telling young women to dump their boyfriends if they fail to sign up.

“We found a way to make politics fun, trendy, fashionable—and to some extent sexy,” says Mr Ademba. He attributes

much of their success to scores of local groups on WhatsApp, a messaging app. These have helped young Kenyans from across the country spread the word and head to registration centres together.

Activists hope that the newly registered voters will turn out—and vote against Mr Ruto. Kenya's Gen-Z protests began as a tax revolt before becoming a display of the “power of the youth to organise and put pressure on the state”, says Mwanase Ahmed of the Pan-African Solidarity Network, a pressure group. But because the state has since cracked down on demonstrations, formal politics are now more important. By one count 6m more young Ken-

yans will be eligible to vote next year than in the last election in 2022. Many are furious with Mr Ruto because of his repressive tactics and because he came to power on a pro-youth programme which he has failed to deliver. This makes them potential “kingmakers or kingbreakers”, says Martins Kwazema of the Nordic Africa Institute in Sweden.

There are also big challenges. Young Kenyans are a politically engaged bunch; 57% report reading the news frequently on social media, according to Afrobarometer, a pollster. A new study by University College London finds widespread awareness of new laws and policies even among rural youngsters. Yet self-reported turnout among Kenya's young has been in decline since at least 2013. One estimate put turnout in 2022 among 18- to 25-year-olds at under 40%; overall it was 64%.

Could Niko Kadi buck the trend? Mr Ruto has welcomed the growth in voter registration. But as Ken Opalo, a prominent Kenyan academic, has argued, widespread antipathy towards his administration means the president stands the strongest chance of re-election if turnout is low. Activists therefore expect the state to throw everything it has at them.

Mr Ademba himself was briefly arrested during a registration drive in July. As the election approaches, activists worry most about goons: armed thugs hired by officials to intimidate opponents and terrorise protesters. Under Mr Ruto Kenya has suffered a surge in such violence.

Despite their shared anger at Mr Ruto, young Kenyans do not yet agree on who should replace him. Failure to unite around a single candidate could hand Mr Ruto victory. Legions of enthused young voters would be a sign of democratic health. But they offer no guarantee of change. ■



Two potential kingbreakers

Europe



Ukraine and America

Arms-twisting

KYIV

In exchange for Russian oil, Donald Trump squeezes Ukraine's military lifeline

UKRAINE'S AIR-RAID sirens are the final link in a ballistic warning system that usually begins with American satellite or signals intelligence. They give citizens a few minutes to brace for an attack. But on the nights of October 12th and 13th scores of Russian missiles slammed into Kyiv with little or no warning. Ukraine said there had been no intelligence from its partners. In an interview published in the *Financial Times* on October 15th, Volodymyr Zelensky, Ukraine's president, accused America of cutting it off.

American officials have threatened to do so since Donald Trump's announcement on October 9th of a deal to let Russia sell diesel fuel. They demand that Ukraine stop attacking Russian refineries. Arms supplies are at risk as well. The Americans have privately warned that they may pull the plug on the Prioritised Ukraine Requirements List (PURL), the mechanism by which European countries pay for Ameri-

can weapons sent to Ukraine.

Mr Trump insisted on October 13th that intelligence sharing was continuing. Yet Ukrainian officials soon reported that Elon Musk's SpaceX had restricted the Starlink terminals used aboard Ukrainian attack drones. The terminals began to lose connectivity at speeds of around 160kph, forcing some units to cancel attacks. Mr Musk said it was America's armed forces that have control over those contracts.

It all added to the grim mood in Kyiv.

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Amid drone and missile barrages and power cuts, there is no sign of the "energy ceasefire" Mr Trump claims to have brokered between Ukraine and Russia. In a neighbourhood on the city's left bank on October 14th residents of a nine-storey apartment block collected plywood to board up windows shattered by a ballistic missile. Russian strikes have killed well over 100 civilians so far this month.

Mr Zelensky says he will accept an energy ceasefire if Russia does. To appease Mr Trump, Ukraine suspended attacks on Russian energy targets for three days. But Russia struck dozens of Ukrainian energy facilities during the supposed truce. Mr Zelensky told the *Financial Times* that attacks on Russian refineries will resume.

The Starlink limits are a serious blow. Ukrainian troops use the system to guide drones in Russian-occupied territory. (The system does not work inside Russia itself.) "Almost all of our mid-range strike capabilities rely on Starlink," says a Ukrainian military-intelligence source. The timing of the restrictions "cannot be a coincidence", Serhii Beskrestnov, an adviser to Mr Zelensky, wrote on Telegram.

Ukraine can snoop for itself, using commercial satellite imagery, but its feeds are not as rich as America's. America also lets Ukraine use cutting-edge artificial-intelligence tools to crunch data. Europe ►►

▶ cannot replicate this. When Mr Trump briefly blocked intelligence sharing last year, Britain and France were unable to guide the cruise missiles they had given to Ukraine. And cutting off American intel would badly hurt Ukraine's ability to shoot down Russian missiles. "Nobody in the world has those capabilities," says a Ukrainian air-defence specialist.

Ending PURL would also be devastating. Ukraine depends on the programme for 95% of its Patriot interceptors and for many of the missiles its F-16 fighter jets use to shoot down jet-powered drones. The next shipment is reportedly imminent, so Ukraine will know soon if it is blocked. Some Patriot interceptors are coming from European countries, as well as a new generation of SAMP/T air-defence systems from France and Italy. But "PURL is the only solution we have to protect critical infrastructure," says the air-defence officer.

Dependence on America makes desisting from strikes on Russian oil infrastructure seem the obvious choice. But it is a potent tactic to give up. Burning refineries grab the world's attention and raise morale. Fuel shortages force Russians to stop ignoring the war. And the damage is cutting into the Russian state's oil revenues. Our analysis this summer showed that those had fallen 34% short of what would be expected, based on global oil prices.

There are other valuable targets that Ukraine can hit. Figures from Armed Conflict Location & Event Data, a conflict monitor, show only 21% of Ukraine's strikes into the Russian heartland were on oil-related facilities. Besides data centres and retail warehouses, the vast majority were military-industrial. These are the factories supporting Russia's war machine, producing the 28,000 jet-powered attack drones it expects to build this year.

There are no practical alternatives to what America provides. Only China and Russia are close to a Starlink equivalent. Europe is years away from American levels of missile production. For all Ukraine's extraordinary resilience and inventiveness, its war effort depends on outside support.

Ukraine has no alternative to American sensors and satellites, which map Russian spoofing, jamming, and troop movements, helping the Ukrainians plan and conduct drone attacks. Ending such co-operation would cripple Ukraine's ability to take the fight to Russia. "From the very beginning of any mission we design, there is a really critical element of [American] intelligence," says a Ukrainian intelligence source. European allies have expanded their own satellite-surveillance capacity, but "the Americans can see inside Russia 24 hours and seven days a week," says the source. "Without this [intel] exchange, it would be really hard, almost impossible, for us to fight." ■

Russian mobilisation

Fight or flight

MOSCOW

Russians are again fleeing before the army can grab them

ON SEPTEMBER 18TH Dmitry, a 35-year-old Muscovite, cast his vote in Russia's sham parliamentary elections. He wrote "criminal" on his ballot, slid it into the box and went to the airport, from where he flew to Istanbul. He was one of thousands who have left in recent weeks, fearing that the election would be followed by a wave of military mobilisation.

Russia's partial mobilisation in September 2022, six months after its full-scale invasion of Ukraine, drove 400,000 Russian men to flee the country. This time the numbers are smaller. In late August about 20,000 people a day were crossing into Georgia, triple the normal number. In Armenia, another country that admits Russians without a visa, rents have risen by 30-50% since the spring. Anastasia Burakova of Kovcheg (Arc), a group that helps anti-war Russians to emigrate, says inquiries have gone up eightfold since July.

Rumours of a new wave of mobilisation have circulated for months. Ukrainian officials have predicted a call-up of at least 100,000 men; on September 24th Emmanuel Macron, the French president, put it at 300,000. The Kremlin says nothing of the sort is planned. "Utter rubbish," Vladimir Putin said before the elections.

Yet Russians tend to think that the more emphatically authorities deny it, the more likely it is to happen. In 2022 the Kremlin denied mobilisation was in the

works just a week before it was announced. No official declaration is needed, since the previous order has never been repealed.

This summer there were protests in Penza, 600km east of Moscow, after recruiters grabbed people off the streets. To avoid more unrest, the next wave will be more covert. Debtors, the unemployed and failing students may be coerced. Some believe it is already under way. A military lawyer says DNA samples are being collected from prison inmates in Ryazan, the better to identify their corpses at the front.

Quotas are being sent to governors and bosses at big firms. Nikolai Mitrokhin of Bremen University, an analyst of the war, says rich regions are, in effect, buying recruits from poor ones. The sign-up bonus in wealthy Sverdlovsk is 3.1m roubles (\$37,000), nearly four times that in poorer Syktyvkar. Recruits from poor regions go to rich ones to sign up. Some regions outsource recruitment to criminal gangs, according to Janis Kluge of the German Institute for International and Security Affairs.

Military bloggers and nationalists are eager. On July 30th Rusich, an ultranationalist outfit, called for "the mobilisation of half a million men". Western analysts have long thought a new wave of mobilisation would be risky and might provoke protests. Yet in fact mobilisation can be useful to Mr Putin, allowing him to demonstrate control over the system.

One big question is whom to mobilise. Fitter and better-educated soldiers would achieve more than the old, poor and desperate ones Russia recruited in previous drives. A second question is how much training and equipment new troops will get. A big, well-trained new cohort could make a difference to battles in urban terrain, where drones are less effective. The thin screens of drone-supported soldiers that Ukraine uses to hold parts of the front may no longer be enough.

At the moment Russia's army attracts mainly men with few prospects, argues Vladislav Inozemtsev, a Russian economist. Some may have little desire to live and want to leave something to their families. Soldiers are paid just 200,000 roubles a month, much of it stolen by their superiors. But there are large sign-up bonuses and a death benefit of 15m roubles for next of kin, more than ten times the average annual income. Russia is spending 2.5% of its GDP on manpower, nearly half of it on payouts to the dead and wounded, according to Re:Russia, a think-tank in Vienna.

To attract recruits more interested in staying alive, the Kremlin might increase monthly payments and reduce the death benefit. Dmitry does not want to be part of that calculus. He is looking for a job in Istanbul and hoping his wife and child can join him. "I want to live in Russia, but without these kinds of risks," he says. ■



A new life awaits you

Iberian immigration

Lessons from Lisbon

LISBON AND MADRID

Portugal's immigration policy is more pragmatic than Spain's

NESTLED BENEATH Lisbon's former Moorish quarter, the Rua do Benfornoso is a winding street of decaying buildings faced with *azulejos* (decorative tiles). It is lined with Indian food shops and stores selling hookah pipes and mobile phones. Piedade, a Portuguese woman who has lived here for over 60 years, dislikes what has happened to it. "There's drugs and crime," she says. "I stay inside at home."

The Rua do Benfornoso has become the symbol of a massive wave of immigration. The Portuguese are accustomed to migrants from their former colonies in Brazil and Africa, who speak the language and integrate fairly easily. But between 2017 and 2024 more than 1.1m immigrants took the foreign-born population from 4% to 14% of the total. The new arrivals included 250,000 South Asians, mainly young single men. Many of them speak almost no Portuguese. Immigration became a top public concern. Chega ("Enough"), a new populist right-wing party, won 23% of the vote in a parliamentary election in 2025.

"We were not in control," says António Vitorino, a Portuguese former European commissioner. It became crucial, he says, to "rebuild the credibility of the migration-regulation system". The centre-right government of Luis Montenegro, which came to office in 2024, set out to do this. It required immigrants to get appropriate visas, re-established a border force, stretched the time to obtain citizenship to between seven and ten years, and restricted family reunions. It also introduced fast-track visas for key workers. "We're not a closed-door, 'remigration' government," says António Leitão Amaro, the minister responsible for

the reforms. Net migration has fallen from 270,000 a year to 60,000.

Across the border in Spain, in contrast, the Socialist prime minister, Pedro Sánchez, has defied the European Union's consensus on tighter controls. Spain too has seen a spike in immigration, with 3.1m coming since 2021. In 2026 the foreign-born population hit 10.3m, over 20% of the total. Mr Sánchez has stressed not only Spain's humanitarian values but the benefits of immigration to economic growth. It helped that around half of the immigrants are Spanish-speakers from Latin America.

Earlier this year Mr Sánchez irritated other EU governments by announcing an amnesty for those without papers. The government expected 500,000 to apply; 1.2m did. Portugal, too, plans to regularise up to 800,000. But unlike in Spain, applicants are interviewed individually and 45,000 have been rejected, says Mr Amaro.

Immigration has strained both countries' public services. Lisbon suffered a shortage of school places this year. In Spain teachers say immigrant children may lack language skills or arrive with a learning deficit. Many schools in Madrid are seen as immigrant ghettos; teachers seek jobs elsewhere. In the health service, waiting lists for operations are at record levels.

The most dramatic impact has been in housing. Mr Sánchez called a snap general election for November 29th on the issue. But the move may rebound. Critics point out that Spain's overheated housing market is a result of immigration combined with a lack of new building. And the memory of a surge of over 80,000 migrants into Ceuta, a Spanish exclave in north Africa, in late July is still fresh (10,000 are still there).

Spain's consensus in favour of immigration is breaking. Polls show a majority think there are too many immigrants. Vox, an anti-immigrant populist party, has risen to around 19% in the polls. But immigrants continue to arrive. "They know they can come and sooner or later they will be legalised," says Maria Miyar, a sociologist at UNED university. Earlier this year Teresa García-Milà of the Cercle d'Economia, a business group in Barcelona, argued for "a fundamental debate we haven't had" about "our real capacities of reception and integration". Cutting immigration can stimulate the economy in some ways: Portugal's previous lax rules meant "companies didn't have to improve their efficiency because they got cheap labour," says Mr Amaro.

In Spain, with polls showing the right likely to win the election, policy seems certain to change. Alberto Núñez Feijóo, the leader of the conservative People's Party, wants a points system and quotas for immigration and priority for Latin Americans. That sounds like the Portuguese approach. Iberia may soon no longer be an exception to the European norm. ■

Art theft

Smash burglars

VIENNA

Why today's art thieves lack style

LILLI HOLLEIN, director of Vienna's Museum for Applied Art (MAK), has had a tough six weeks. On August 27th two armed thieves stole a platinum necklace valued at more than \$4m from the museum. Wearing no masks, they entered the building, bought tickets, waltzed in and smashed the display case with a hammer they had hidden in their clothes, then escaped.

The MAK reopened the next day, having belatedly installed metal detectors. Ms Hollein came under fire for lax security. On October 2nd an investigation found that the MAK behaved properly: resisting the thieves would have endangered visitors. The museum had 185 cameras, 125 alarm sensors, safety glass and trained guards. Yet the report concluded that the theft could not reasonably have been prevented.

The idea that one cannot stop hoods from robbing museums sounds bizarre. Rather, it seems the threat has risen and the response is inadequate. European museums, Ms Hollein says, are confronted with newly violent smash-and-grab attacks that last just a few minutes. Police usually take four to five minutes to arrive.

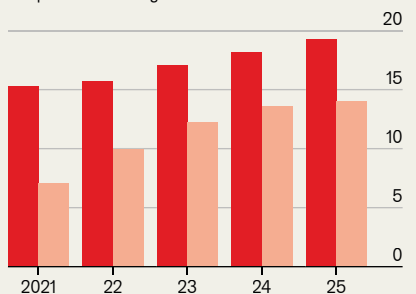
"Art theft has always existed," says Anthony Amore, head of security at the Isabella Stewart Gardner Museum in Boston, where 13 masterpieces worth about \$500m were stolen in 1990. But he notes an increase in high-value robberies in Europe, where first-rate art is found even in small provincial museums. In August thieves stole four masterworks by Antonello da Messina, worth up to €80m (\$89m), in a town in Sicily. Spectacular heists such as last year's theft of jewellery worth €90m from the Louvre can inspire copycats, says Arthur Brand, a Dutch art-crime investigator. Just 12 hours later, 2,000 gold and silver coins were stolen from a museum in north-eastern France.

High-tech solutions such as display cases that drop through the floor when assaulted are expensive. But few European museums even have metal detectors. Mr Amore says they need to develop multiple layers of protection and strong relationships with local police. But displaying art publicly will always make it possible for a thief to grab it.

Not from around here

Foreign-born residents, % of population

■ Spain ■ Portugal



Source: National statistics

An interview with Alice Weidel

The woman who would upend Germany

BERLIN

Send migrants home. Let Russia beat Ukraine. But on other questions, the AfD co-leader is hard to pin down

ALICE WEIDEL, co-leader of Germany's populist-right Alternative for Germany (AfD), has good reason to think her moment has arrived. Her party has opened up a wide polling lead and stands on the cusp of running its first-ever government, in the state of Saxony-Anhalt. In the course of a 75-minute video interview for *The Insider* in a Bundestag meeting room, she offers a confident and fluent performance. Nonetheless, working out what Ms Weidel stands for can prove elusive.

What she opposes is clear. Start with German backing for Ukraine's defence against Vladimir Putin's invasion. Futile, she says: Ukraine is "too small" and has "already lost". Germany should apply "pressure on the Ukrainian president" to end the killing. Policy must follow "Germany first" principles, including by emulating Donald Trump's diesel deal with Russia.

Worse, prolonging the war "endangers Germany" since it could become a target. This is plausible, as Russia's hybrid attacks on NATO allies suggest. And yet Ms Weidel is reluctant to call out Russia as a threat. Germany recently blamed the Kremlin for a failed drone attack at Leipzig airport. But Ms Weidel says she has seen no evidence that Russia was behind this "so-called attempted drone attack". Anyway, what about the presumed Ukrainian bombing of the Nord Stream gas pipelines?

This rhetorical judo is a habit. Asked for signs that Mr Putin wants peace, Ms Weidel throws the question back: what about Volodymyr Zelensky? She accepts Russia was the aggressor in 2022, but adds, "when diplomacy is at the table, history is sitting there too." She means that for decades the West ignored Russia's security concerns, and must stop doing so.

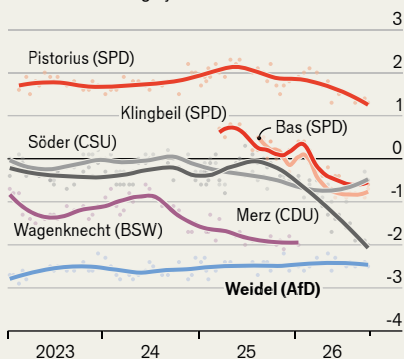
Ms Weidel, a self-styled "libertarian conservative", fulminates against Germany's surge in spending, which she says will lead its interest payments to double in three years. Analysts say the AfD's budget proposals do not add up. But Ms Weidel insists that slashing energy subsidies, foreign aid and welfare can pay for tax cuts and debt reduction. She does not include defence, which accounts for the largest share of new borrowing. Indeed, she accepts "we will have to spend more". But rather than offer details she simply condemns German support for Ukraine.

As for the euro, it is a "myth" that the AfD seeks to leave, says Ms Weidel (though

Not warming to her

What do you think of these politicians?

Germany, 5=think very highly of, -5=do not think highly of



Source: Forschungsgruppe Wahlen

its manifesto in last year's election in effect urged exit). Instead she wants thorough reform such that the European Central Bank stops financing "highly indebted" countries. Marine Le Pen wants "free debt financing, even though France is already in a huge debt crisis". Europe is "certainly" headed for a bond-market crisis.

Only one question irritates her. Ms Weidel calls the suggestion that the AfD harbours extremists "completely unfounded", although countless party figures have been linked to ethnonationalist or neo-Na-

zi groups. On "remigration", a slippery term beloved of the populist right, Ms Weidel says it simply means deporting failed asylum-seekers and the like. Since Syria's civil war is over, "100% of the Syrian citizens" must return, as must Afghans and the 1m-plus Ukrainians in Germany, once the peace she claims is close takes hold. "Four to five million" will have to go.

"Professionals who want to work here", by contrast, are welcome. "I love it! Everyone loves it in my party!" exclaims Ms Weidel. So does she disavow her colleagues in Saxony-Anhalt whose recent manifesto railed against "culturally alien skilled workers"? Not at all. Indeed, the foreign workers that Germany should aim to attract are put off by failures of integration.

Behind the bluster lurks a skilled political manager. She forcefully defends Björn Höcke, the AfD's most divisive figure, who has been fined for using a banned Nazi slogan. But she once tried to have him expelled, only to discover he commanded too much support. Ms Weidel has personally failed to capture voters' affections (see chart). But her ability to pick her battles, suing for peace where necessary, is her most valuable political asset.

Might that extend to other German parties? All mainstream outfits exclude the AfD from coalitions under the so-called *Brandmauer* (firewall) policy. This, Ms Weidel alleges, forces a country that votes for right-wing policies to accept left-wing governments. Yet should the *Brandmauer* fall, negotiating coalitions would require the AfD to compromise, primarily with the centre-right Christian Democrats (CDU). And this is not to Ms Weidel's taste. "Why should we?" she asks. "On our main points...there are no compromises to be made. The CDU has to move first. And if it doesn't move quickly, it will perish." ■



Alice Weidel sits well to the right

CHARLEMAGNE

A tale of too many cities

Europe has lots of pleasant cities, but too few that matter



IS PARIS a big city? It depends on whom you ask. A tourist with only a few days to take in its sights will probably find it dauntingly large. To the French it occasionally feels smothering, the bloated administrative headquarters of an over-centralised country. But after 20-odd centuries of existence, the *Ville Lumière* has a distinction besides that of top tourist destination or national capital: it is by some distance the European Union's largest city, a metropolitan standard-bearer for a largely urbanised continent. And seen through that lens it starts looking rather...*petite*. With one-third the population of Shanghai and less than half the economic output of New York, Paris makes an underwhelming urban flagship for a union of 450m people. Europe has perfected the art of making cityscapes pleasant. Making them mighty engines of economic dynamism is another matter.

Europe's cities are a wonder to behold. A stroll through Lisbon, Stockholm or Krakow is a fine way to while away an afternoon. The latest ranking of the best places in the world to live, compiled by the Economist Intelligence Unit, our sister company, puts Copenhagen and Vienna at the very top. (Indonesia's Jakarta, the world's largest city, with a population of 42m, comes in 132nd.) But what they make up for in charm Euro-cities often lack in size, and thus commercial heft. The ten biggest urban areas in America account for a third of its economic output. In the EU the figure is nearer one-sixth, according to Oxford Economics, a consultancy. Even China and India, with their vast rural hinterlands, have a bigger share of output coming out of their largest cities. Of the 82 urban areas estimated by the UN to have a population of more than 5m people, Paris (in 36th place, with just under 10m people) and Madrid (72nd) are the only ones in the EU that make the cut.

Et alors? some might ask. Who would want a Jakarta-sur-Seine, a Tokyo am Rhein? Economists might. For them, when it comes to cities, bigger nearly always means better. Cramming more humans near each other creates more opportunities to match productive workers with innovative firms. The result is the sort of economic dynamism Europe desperately needs. Doubling the population of a city is associated with a double-digit growth in productivity, according to the OECD, a club of mostly rich countries (even smaller

increases make a sizeable difference). In part that is because more productive people will flock to metropolises to seize opportunities. But even accounting for that factor, bigger cities make everyone richer just by making it easier for ideas, skills and opportunities to circulate. World-class amenities, from football stadiums to opera houses, help make up for congestion, high rents and cramped living conditions.

Europeans like their cities big, but not too big—and for there to be lots of them. This is partly for historical reasons. Centuries of weak central states and municipal independence led to a dense lattice of powerful cities. Many gradually seeped out of their tiny medieval boundaries, sometimes despite planning laws designed to protect against unsightly sprawl. In time European conurbations settled into the shape and size that made sense given their respective countries (or regions, in the case of Germany, a place with lots of competing urban centres). Even a city with grand aspirations could not outgrow its immediate national confines.

What is perhaps surprising is that this pattern of urban development has so far survived the past few decades of European integration. In theory businesses and citizens ought to think of their “home” as the EU, rather than individual countries, the better to compete against rivals in China and America. A single market in workers and ideas should have resulted in a handful of megalopolises acting as powerhouses for an integrated EU economy, not just a national one. A few European cities have specialised into continental hubs of global import: Milan in fashion, Eindhoven in semiconductor-manufacturing equipment, Brussels in crafting regulations. But none has the oomph of New York and its role in global finance, for example, or Shenzhen and manufacturing.

The result is the dispersal of riches across multiple midsize cities, many of them national capitals, yet none of them quite up to global snuff (sorry, Prague). In a world of winner-takes-most globalised industries such as artificial intelligence, this is a sizeable disadvantage. A bright graduate from America's 50th-biggest urban economy (Charleston, South Carolina) with dreams of working in tech will undoubtedly make for San Francisco, the gateway to Silicon Valley. His counterpart in the EU's 50th-biggest city (Graz in Austria) will have many options. Should she go to Silicon Allee in Berlin, Silicon Docks in Dublin, perhaps the Silicon Sennier in Paris? Such dispersion gnaws at European competitiveness.

Capital punishment

Europeans strolling through their souped-up towns might console themselves with two thoughts. The first is that it may be possible to replicate the advantages of metropolises by connecting lots of nearby midsize cities. Could Amsterdam, Antwerp, Cologne and Brussels—all of them a short hop away on high-speed trains—not join forces to create a mega-hub that could turn them jointly into one city of global scale? Alas not: the advantages of being in the same place seem to decay sharply over even short distances (especially if spread across different countries).

The second is that being a pleasant place might matter more than eking out that last ounce of growth. Having lots of middling cities means none is likely to disconnect from its home politics. In an age when plenty of voters feel “left behind” by out-of-touch metropolitan types, that may be worth something. With its dense thicket of wee cities, Europe has no New York or Los Angeles to dominate global industries. But neither does it have vast swathes of “flyover country” for urban elites to sneer at. ■

Britain



State of emergency

Dad's Army returns

Britain's government wants its citizens to prepare for crises

AT A DISUSED hospital in north London, Colin Harmsworth puts his army through their paces. Clad in orange berets, they learn how to strap tourniquets to bleeding limbs and operate drones. Mr Harmsworth founded the Joint Civil Aid Corps to help Britain's emergency services during a national crisis. Its members, he says, must be uniformed and disciplined: when duty calls, it's no good turning up in jeans and arguing.

On paper the vision is sprawling, the product of 14 years of deliberations. Mr Harmsworth, a former cavalry soldier, took inspiration from the Civil Defence Corps, which in the cold war was tasked with digging Britons out of whatever remained of bombed cities. He imagines a force of more than 80,000 volunteers, spanning the country, and a budget north of £180m (\$240m). There would be roles for medics, quartermasters, meteorologists and a drum corps. For now, however, volunteers

number in the low hundreds and must buy their own uniforms. Mr Harmsworth, the "commandant", is on the hunt for a philanthropist to make his dream reality.

His beret-wearers, meanwhile, are the British state in microcosm. Once dismissed as an eccentric pursuit, the task of galvanising Britons for "whole-of-society" responses to crises now preoccupies Whitehall. Like Mr Harmsworth, officials are adept at producing long policy papers

but short of cash. Whether the state is in better shape for a crisis than the Joint Civil Aid Corps remains unclear.

Government ministers are planning a flurry of "big-muscle moves" on the topic. A public-information campaign will soon encourage Britons to stockpile food, water, torches and radios in preparation for emergencies such as bad weather. Similar measures already abound in other European countries, but a government survey found that 32% of Britons have supplies for only a day or less. Next year hundreds of officials and ministers will take part in Exercise Albiston Shadow, a war game to test the state's reaction to hybrid attacks by a hostile power. The home-defence "war books", as classified plans are known, are being updated for the first time since 2004.

Ministers are also preparing the Defence Readiness Bill, with provisions for mobilising armed-forces reserves and industries in a crisis. An emergency communications channel, the Resilient Voice System, is being upgraded. ThinkLabour, a think-tank with close government ties, proposes a volunteer National Resilience Corps that resembles groups in the Nordic states (and Mr Harmsworth's vision).

One threat such measures must guard against is conflict. Sir Keir Starmer, the previous prime minister, warned in the spring that Britain might be at war with a ►►

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— **Wargaming a fiscal crisis**

► rearmed Russia by 2030. Last week in Berlin Andy Burnham, Sir Keir's successor, said sabotage and cyber-attacks by hostile states were growing more frequent. The government thinks Iran was behind what seemed to be an attempted attack on RAF Fairford, an airbase in Gloucestershire.

Prepare for the worst

Officials must also plan for natural disasters such as pandemics, floods and wildfires. And Britain's shoddy infrastructure might give way, too. In the 2026 edition of the National Risk Register, officials updated the odds of a whole region losing its water supply from below 1% to 5-25%. The impact, they said, would be "catastrophic".

The catastrophising was long overdue. Britain's state used to fear citizens would scorn advice on how to meet disaster. The ridiculing of the cold-war-era "Protect and Survive" information campaign is still remembered in Whitehall, says Toby Harris of the National Preparedness Commission, a non-profit venture.

Now there has been a "sea change in mentality, at least in the Cabinet Office", says Elizabeth Braw of the Atlantic Council, another think-tank. During the covid-19 pandemic Britons followed lockdown rules surprisingly strictly; 500,000 signed up to volunteer within 24 hours. A survey found that 84% wanted the state to tell them how to prepare for crises.

Are its plans now sound? One problem is that Britain often uses its armed forces for civilian problems such as security at the Olympic games, wildfires and public-sector strikes. In a conflict, though, all available troops might be engaged in fighting, says Ed Arnold of RUSI, yet another think-tank. And so while the state can respond well to one crisis, it is bad at planning for several occurring at once. Moreover, a

"whole-of-society" plan is not much help if society does not know what it is. And here, as in so much else, Britain's state displays a pathological inclination to secrecy.

Occasional glimpses behind the curtain are not reassuring. Consider preparations at the Department for Environment, Food and Rural Affairs (DEFRA) for interruptions to food supplies. Officials fear supply chains are vulnerable—to cyber-attacks on the power grid, for instance. Food is designated one of 13 "critical national infrastructure" sectors. But DEFRA has "very little confidence" that cross-government governance of such sectors is joined up, and a database of relevant businesses and sites is yet to cover the food industry.

Businesses, meanwhile, have not seen the "playbook" DEFRA has drawn up for a

food crisis. The National Audit Office has observed, drily, that this means the "plans may not work in practice". The industry has not been invited to Whitehall's crisis exercises. Nor have Local Resilience Forums, the provincial bodies meant to manage crises, been told what to do when the supermarket shelves are bare.

Money is part of the problem. Ministers boast that Britain will next year hit a new NATO target of spending 1.5% of GDP on "resilience". Yet it will not spend a penny more than originally planned. DEFRA officials deemed the cost of a full emergency food plan too steep, opting for a "minimum viable product". Money frustrates Mr Harmsworth, too. "In my heart of hearts, I know I can make it work," he says. But only "if I have sufficient funding to do it." ■

Modern warfare

Skeet and destroy

WILTSHIRE

Attack drones, meet Britain's crack clay-pigeon shooters

IT WAS A bad day to be a clay pigeon. On a misty morning in Wiltshire, British soldiers gathered for their annual shooting championship. Around 100 shot at 100 targets each—a massacre. Shotguns boomed, and neat clay discs were blasted into bright bursts of colour.

Clay-pigeon shooting was born in the late 1800s to help hunters improve their aim. In the second world war it was used to train fighter pilots. Today Peter Meager, boss of the army's clay-target shooting team, hopes it can help prepare soldiers for drone warfare. "I think there are huge transferable skills," he says.

Such skills are needed. Drones are behind 80% of the enemy targets Ukraine destroys. In June Britain's Defence Investment Plan committed £750m (\$950m) to counter-drone protection. Futuristic solutions include acoustic radars and direct-energy weapons.

Victorian ones might help, too. Shotguns are great for hitting aerial targets because their shells contain many projectiles, which spread out in the air. That makes it easier to catch a bird's wing or a quadcopter's propeller. But the army trains soldiers to shoot rifles instead.

The two are very different, says Ben Cookson, one of the army's crack shots. Rifle shooting is about "being as still as possible". You get in position, aim, breathe in and fire. "If you do that with a shotgun you're doomed." Hitting an airborne target means moving with it and judging how far ahead of it to aim.

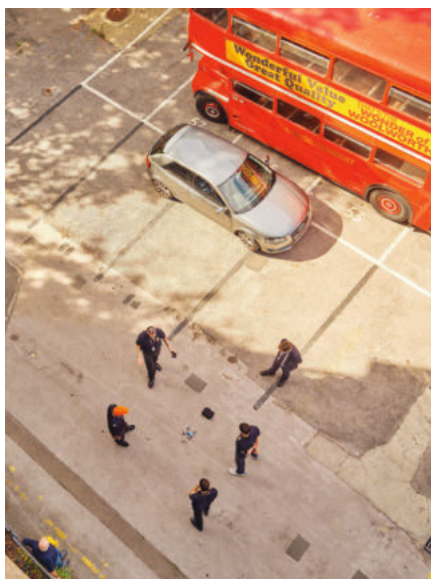
When rifle shooters come to Mr Cookson for tutoring, "we have to completely retrain them", he says.

Clay-pigeon shooting is a good place to start. Launchers built to mimic the flight patterns of different birds can feasibly simulate those of drones, too. Most can fire clays at a drone-like speed of 50mph, and some at over 100mph.

And so, after Ukrainians told British instructors how useful shotguns were on the front line, the army started using clays to develop soldiers' proficiency with them. But a shotgun should only ever be "a last resort", says Mr Meager. A drone within range of one is already too close—much better to down it earlier.

Plenty of questions still hover over shotguns' use as an anti-drone defence. Spotting the things is hard. In Wiltshire some shooters don tinted goggles to make the orange clays pop. Might whizzier versions help identify a distant, fast-moving quadcopter? Can standard lead shells take down armoured military drones? How widely should the shot be spread when targeting an incoming one?

These are questions for the nerds. At the army's tournament the focus was on technique: the top score was 94 out of 100. Your correspondent, while not quite managing that, did at least avoid embarrassing himself in front of the troops ("a natural", said Mr Cookson, a kind man). Spirits were high. But one cloud hanging over the day had little to do with the rain. "I hate drones," sighs Mr Meager.



Not quite a 50,000-foot view

Britain and Israel

A slippery slope

JERUSALEM

The once-special relationship is faltering

THE UNION JACK still flies in Jerusalem, over the same building it has been on for 59 years. On October 8th Israel and Britain agreed, after weeks of diplomatic wrangling, to rename this office the UK Mission rather than the Consulate-General. Both countries saved face but the fracas between them is far from over.

Their spat began soon after Britain changed its prime minister in July and appointed Ed Miliband as foreign secretary. One of his priorities has been to harden Britain's position on Israel's brutal war in Gaza and its de facto annexation of the occupied West Bank. In some places Israeli settlers have been carrying out ethnic cleansing with tacit support from their government. Many, especially in the Labour Party, thought Britain's government was previously far too soft on this.

On September 8th Mr Miliband announced sanctions on Israeli settlements in the West Bank, as did France and Canada. Previous such efforts by Western countries, targeting individual settlers and organisations, have had limited effect. The difference this time is the intention to take "action on services" and "companies that support, facilitate or profit from illegal settlement activity". This broad brush might paint everything from government ministries to Israel's biggest banks.

In response, the Israeli government said it would close Britain's consulate in Jerusalem, which serves its relations with Palestinians, and remove Britons working on Gaza's planned reconstruction. Britain then threatened to escalate matters by expelling Israeli diplomats. The eventual compromise of renaming Britain's consulate has cooled things for now.

Two big questions hang over Britain's new stance on Israel. First, how far is it prepared to go? Mr Miliband has said he will need six to nine months to prepare legislation for the sanctions, and that they will target only the settlements, "not Israel", with which Britain has "important and valued trade". The sanctions, when they materialise, may therefore be little more than a gesture. But they may also be designed to cause serious damage. This uncertainty probably explains in part why America has not yet intervened. "It's a game-changer," says one senior Israeli diplomat. "Everyone understands what this can mean and Israeli banks are very worried."

The second question is over timing.

Some in Britain's Foreign Office wanted to delay Mr Miliband's announcement until after Israel's parliamentary election on October 27th. Binyamin Netanyahu, the country's prime minister, will not change its settlement policy when he needs to appeal to right-wing voters. After the election there may be a different government in Jerusalem. Mr Miliband, though, has his own political timetable.

Palestine has become a huge issue in British politics. In the 2024 elections Labour lost five seats to independent pro-Palestine candidates. This year, as in past ones, protesters waved Palestinian flags outside the Labour Party conference. But Mr Miliband's sanctions statement nevertheless made it easier to remove the issue from the conference's agenda—the result he was after, says one Labour adviser. His next steps might also be dictated by domestic politics, especially if the government calls an early election.

On September 30th Mr Netanyahu fired a shot across Britain's bows. He lambasted the country in an interview with Fox News for announcing its sanctions "pretty much the next day" after Israel gave it intelligence on the "Iranian-sponsored" attack on an RAF base.

Israeli spooks were agast at what they saw as Mr Netanyahu's breach of secrecy. Close co-operation between the two countries' intelligence services has long served both sides well, and the prospect of Iranian attacks on British soil gives them an obvious shared enemy. But some in the Israeli government argue that further British sanctions should be met with threats to withhold intelligence. "Ministers with political agendas could put us on a slippery slope to disrupting intelligence-sharing and harming both countries' national security," warns one Israeli official. ■



What's in a name?

Legal lore

Standing on ceremony

The City of London honours an ancient pact

IN A FUSTY room at the Royal Courts of Justice, a man in a tricorne hat receives a payment. He is the king's remembrancer, an office once charged with keeping track of money owed to the crown. This is the annual Ceremony of Quit Rents, held this year on October 14th. The earliest recorded one was in 1211. Each year the City of London pays a levy to the monarch for two plots of land: six giant horseshoes, 61 nails and two knives, one blunt and one sharp.

The remembrancer then inspects the wares. An official tries the blunt knife—traditionally a billhook—which should be able to bend a hazel stick without cutting it. Next he wields the sharp one, which needs to chop through the wood. Once the horseshoes and nails have been counted, the payment is accepted and the City can enjoy its tenancies for another 12 months.

In theory, at least. These days no one knows exactly where the rented land is, though some have made educated guesses. The first parcel is somewhere in Shropshire, where a man named Nicholas rented moorland before passing his tenancy on. The other is near London's Strand, a stone's throw from *The Economist's* office. It came from a blacksmith called Walter, who paid for access to a forge (hence the horseshoes). Uncertainty over the postcodes has not stopped the crown claiming its due. In today's Square Mile firms hire armies of lawyers to draft agreements and then wriggle out of them. But for the king's remembrancer contracts are sacred.

The ceremony is the sort of thing Britain is famous for. In this common-law country, precedent piles on precedent and keeping up appearances is paramount. Hence the Tower of London has been locked at 9.53pm every night for 700 years, and the king has held an annual swan-counting event for even longer.

Other "quit rents" abound. For centuries the City has paid the crown £11 (\$15) a year for the "town of Southwark". In parts of East Anglia, Leicester and London people honour ancient deals by handing over roses. The Duke of Wellington hangs onto his country mansion only so long as he delivers a French flag to the king each June (something to do with Waterloo).

The autumn ceremony at the Royal Courts of Justice is the most ancient such occasion. Those watching from the public gallery admit the event is nonsense. But, says one, it is "lovely nonsense". ■

BAGEHOT

When did suicide become a lobbying tool?

Public policy is increasingly dictated by tragedy



TALK OF SUICIDE is hard to avoid in Britain. Kemi Badenoch, the Conservative leader, recently warned that inheritance-tax changes mean farmers “are literally committing suicide so that their children don’t have to pay it”. Watch “The Social Reckoning”, a new film about Meta, and an advert will pop up: “Instagram helped kill my daughter”. It is a campaign by the family of Molly Russell, a 14-year-old girl who died by self-harming after she had seen similar things on Instagram (which Meta owns). More than three years after Ruth Perry, a headmistress from Reading, killed herself following a school inspection, teachers still campaign in her name. “I don’t want there to be another Ruth,” said one this summer, calling for the inspection regime to be gutted.

There is, thankfully, no growing epidemic of suicides. British people kill themselves at roughly the same rate as they have for the past few decades. Last year 6,000 people did so in England and Wales. What has shifted is the way Britain’s establishment treats these deaths. Suicide was once a sin. Until 1961 it was a crime; then it was a tragedy. Now, however, suicide is an argument.

Policy is discussed surprisingly often in terms of how likely it is to make someone kill themselves. In the 20th century MPs rarely mentioned such things. Now they do so hundreds of times a year. In 2025 suicide featured in parliamentary debates on asylum claims, AI policy, the public finances, football regulation, special-needs provision, seafarers, the “spring statement”, trans rights and the welfare system. There were also entire debates on male suicide, mental health and whether to legalise assisted dying.

What began as healthy acknowledgment of a dark reality has morphed into something troubling. Bereaved families like the Russells started speaking out to prevent similar tragedies in the early 2010s, says Sir Louis Appleby, a professor at the University of Manchester. Soon enough, no mental-health story was complete without a claim about suicide. At this point the sincere began to mix with the cynical. Some genuinely wanted to raise awareness; others wanted to win an argument. The risk, says Sir Louis, is “to already-distressed people who hear the message: ‘People like you, facing similar problems, are taking their own lives.’”

Suicide is too often framed as a logical response to policy by

politicians. It took little time for a debate about inheritance tax on farms to focus on the idea of desperate farmers killing themselves. Farmers “may well decide that they should not be here” when the law was introduced, said Tom Bradshaw of the National Farmers’ Union in 2024. Rather than something preventable, suicide is portrayed as inevitable if the government chooses a particular course of action (trampling on guidance from suicide-prevention groups). And it works: Labour duly made its inheritance-tax reforms more generous to farmers the next year.

When suicide is prominent in politics, debate can descend into blackmail. Talk of trade-offs or compromise becomes impossible. Ministers making life harder for benefit claimants had “blood on their hands”, said Labour MPs in the 2010s, citing constituents who had killed themselves. In 2019 Peter Bone, a Tory MP, campaigned on behalf of people who had been caught using a tax-dodging ruse and forced to pay back large sums via a “loan charge”. “How many more people are going to take their lives before the loan charge is scrapped?” asked Mr Bone. As a lobbying technique, it was a success. Britain has a more forgiving welfare system than a decade ago, and its tax authority has weakened demands over the loan charge.

Martyrdom was once a preoccupation of extremists. Now it has infected middle-of-the-road campaign groups. When Perry killed herself there was an immediate outcry, with teachers’ unions calling for inspections to be made less intrusive or scrapped. A neighbouring headteacher declared: “It’s really important to us to remember her and for her death not to be in vain.” A tragic death had to be made to mean something. As far as policy went, it did. Labour cited Perry’s suicide when it unveiled reforms hobbling Ofsted, the school inspector.

To be or not to be

Suicide is but one nightmarish problem faced by the state every day. Dead teachers, dead farmers and dead teenagers must be balanced against a million other competing demands. It is a grisly job but a fundamental one for politicians. Increasingly, the British state refuses to admit these trade-offs. Instead, Leviathan wraps its arms around a grieving family in misplaced humanity. Compassion that should come from society instead comes from the state, with pernicious effects on policymaking.

No wonder ministers hide behind coroners when suicide is discussed. An inquest determined that Instagram had played a part in Molly’s death, recommending far tighter rules for children on social media. Labour introduced them. Similarly, Ofsted got a kicking for not doing enough to support Perry. The result is that coroners become de facto lawmakers, with their suggestions—such as watering down inspections or limiting children’s access to the internet—dictating legislation. Parliamentarians end up as little more than secretaries transcribing them onto vellum.

Even the most well-meaning politicians find themselves following a dark strategy, whether cynically or not. Britain is in an emotional state, incapable of resisting grief. Politicians and campaigners use that to their advantage. In their efforts to be compassionate, MPs are witlessly embracing a terrible idea: that good can come from suicide. It is a poisonous line of reasoning, which suicide-prevention groups rightly fight in case it leads to more death. There could be no more destructive message to send. Yet it worms its way into almost every policy area. Why has suicide become a political tool? Because it works. ■

International



Don't get trampled

How to survive a predatory world order

NEW YORK AND WASHINGTON

Middle powers face a new threat: Trump-Putin-Xi collusion

LIKE A VILLAGER urging neighbours to confront a prowling predator together, Mark Carney sought to rally the world's middle powers. In a speech in January to the World Economic Forum at Davos, Canada's prime minister issued an urgent call for mid-ranked countries to unite. This is an age in which the strong prey on the weak, he told his audience of grandees. The old rules-based order no longer constrains the mighty, he advised. Nor can smaller countries roll over and hope that submission keeps them safe. Middling powers can act together in coalitions of the willing, or "be on the menu".

His fellow leaders knew that Mr Carney was mostly warning them about America and China, the strongest of today's big beasts. Mr Carney was speaking from experience. After decades as a comfortable, if unexciting, annexe to the American economy, Canada finds itself the object of President Donald Trump's wrath. Mr Carney

has worked hard to reduce his homeland's dependencies (see Briefing). Other middle powers have studied his confrontation with Mr Trump closely. Yet nine months on, the response to that Davos call to arms looks distinctly patchy.

In some areas the Carney speech aligned with actions that countries were already taking. In this age of economic coercion, choke-points and supply shocks, governments do not need Mr Carney to tell them to hedge their bets, diversify and reduce the leverage of global bullies.

Since the speech, on a few occasions middle powers have stood up to large aggressors and lived to tell the tale. When Mr Trump threatened to invade Greenland and pledged to impose crippling tariffs on any country that stood in his way, European leaders stood by Denmark, Green-

land's ruler. Taken aback by a ferocious reaction from financial markets and by Europe's stated readiness to enact trade counter-measures, Mr Trump dropped dreams of ownership in favour of an enhanced security pact.

Asia has witnessed shows of defiance, too. Despite intense pressure from China, including curbs on Chinese sales of critical minerals, Japan's prime minister refuses to apologise for saying an inconvenient truth aloud. Takaichi Sanae's offence was to confirm publicly that Japan's national security would be imperilled by a Chinese attack on Taiwan, Japan's democratic neighbour. As Chinese officials hurl insults and call her a war criminal, Ms Takaichi cannot back down, politically, and will not.

Yet for each instance of middle-power defiance, there are more examples of feebleness, and of leadership vacuums left unfilled. One big problem is that the middle powers are a disparate bunch, with differing degrees of nostalgia for the order that Mr Carney mourns. Plenty of countries in the global south have always seen America as a bully, and resent Western countries more generally as insufferably self-centred. Such regional heavyweights as Brazil, South Africa or India are not sure who appointed Canada—a blandly rich vanilla milkshake of a country—to lead a new post-American world order. ►►

— The Telegram is away

► Further complicating Mr Carney's pitch, there is no consensus as to who even counts as a middle power (see chart on this page). One definition involves countries with some means to influence world events, whether that is a product of their size, regional clout, wealth, industrial and technological might, diplomatic networks or military power. Perhaps ten or 15 members of the G20 club easily fit the bill, from sundry European powers to Australia, Canada, Indonesia, Japan, Mexico, South Africa, South Korea and Turkey.

Brazil and India belong on the list, though some in those countries aspire to emerging great-power status. Russia thinks of itself as a nuclear-armed superpower, though its economic and demographic woes, and dependency on China, make it a pretty mangy big beast. For all that, Russia is more than a mid-ranking player: its president, Vladimir Putin, is one of a few foreign leaders treated as a peer by Mr Trump, and Russian aggression haunts the wakeful nights of politicians across Europe. There are small countries that control vital technologies, such as the Netherlands or Taiwan, both home to firms that are irreplaceable to semiconductor supply chains. Then come hyper-ambitious powers with commercial or military interests far from home, such as Israel, Saudi Arabia or the United Arab Emirates.

A simpler problem with the Carney speech is that it correctly noted the urgency of the moment, but misidentified the biggest threat currently posed by superpower bullies. The address opens with a warning about "great-power rivalry", a reference to global struggles for primacy between dominant countries, notably America and China. Mr Carney called for "the countries in between" to avoid picking sides or competing with each other for the favour of the giants, and instead "combine to create a third path with impact".

Nine months later, though, great-power rivalries are proving less disruptive than

major-country collusion. Mr Trump is buying diesel from Mr Putin to lower fuel prices in America before midterm elections, and threatening to cut military aid for Ukraine. A fragile truce is, for now, lowering trade and other tensions between America and China. Already, diplomats report hearing officials from America and China proudly calling their respective countries a G2, or a uniquely potent power couple.

You'll need more than a slingshot

Then there is China's and Russia's ever-deepening, lopsided anti-Western partnership. Middle countries can stand up to one great power, on a good day. They have less hope of challenging two giants, defending overlapping interests in concert.

This geopolitical dynamic was accurately predicted, years ago, by Singapore's far-sighted if ruthless founder, Lee Kuan Yew. "When elephants fight, the grass suffers," Lee would say, describing how America-China confrontations endangered bystanders. There is a less-often cited second half to that warning, though: "When they make love, the grass suffers also."

In theory, America and Russia are still adversaries. But in Washington horrified European allies find themselves being scolded by some officials in the Trump administration for backing Ukraine. Such support is called a provocation of Russia.

In New York diplomats at the UN express surprise at how closely America, China and Russia are working on some issues, especially the appointment of a new secretary-general. The suspicion is that those three permanent members of the Security Council favour a candidate who will administer the organisation, not challenge the big powers: a secretary, not a general, as the phrase goes at the UN.

It is not clear how long the current truce between America and China can last. It exists largely because of one man, who sits in the Oval Office. Mr Trump has never been an ideological China hawk, if that means

someone who disapproves of the Communist Party's iron-fisted rule. Now, in his second term, he has no interest in changing China's ways, whether that means confronting China over its economic model or its regional ambitions. He is more interested in selling China soybeans, flogging Boeing planes and securing supplies of Chinese rare-earth elements. To that end, he has told his diplomats and generals to avoid starting a war with President Xi Jinping and is holding up promised arms sales to Taiwan. Judging by their recent summit, neither Mr Trump nor Mr Xi is minded to heed calls from the rest of the world to permit more oversight of their respective champions of artificial intelligence.

That said, the truce with China could end at any moment, for Chinese leaders are playing hardball in large ways and small. In September Mr Trump wooed Mr Xi during that visit to Washington, meeting him in person at Joint Base Andrews, among other shows of respect. Mr Trump expected China to repay him with actions to help Republicans in the midterms, for instance by boosting Chinese diesel sales. Instead, China enraged the president by curbing diesel exports just days later. This instability points to an unenviable choice facing smaller powers. Do they prefer accommodation of China by Mr Trump, based on a division of the world into spheres of interest, or a resumption of full-blown rivalry between two giants?

A surprising number of political leaders express sympathy for Canada as a victim of Mr Trump's bullying, but behind closed doors grumble about the naivety of Mr Carney's advice that middle powers just need to be braver. Not every country is as lucky as Canada, they note. Canadians are blessed with abundant oil, gas and hydroelectricity. Secure in the high north of the Americas, deterring Russia is not the urgent task faced by some fellow members of NATO. Canada can confront America in a way that Europeans cannot, sniffs a senior ►►

A guide to middle powers

● Rule-promoters

Rich, allied, militarily so-so

Mostly high-income; industrialised; committed to multilateral rules; defence capacity modest relative to wealth and often reliant on US cover

MEMBERS

Australia Britain
Canada EU Japan
South Korea Ukraine

RELATIONSHIP WITH AMERICA

Historic allies; ties fraying

● Predators

Strong but weak-pocketed

Revisionist; willing to use force or proxies; large armed forces or nuclear programmes relative to modest, often sanctioned, economies

MEMBERS

Iran North Korea Russia

RELATIONSHIP WITH AMERICA

Adversaries

● Middlest powers

The swing states

Middle income; selectively rule-abiding; militarily weak-to-middling; hedge between the big blocs and sell their alignment dearly

MEMBERS

Brazil India Indonesia
Mexico Pakistan
South Africa Turkey

RELATIONSHIP WITH AMERICA

Transactional

● Type-A tiddlers

Small countries, big dreams

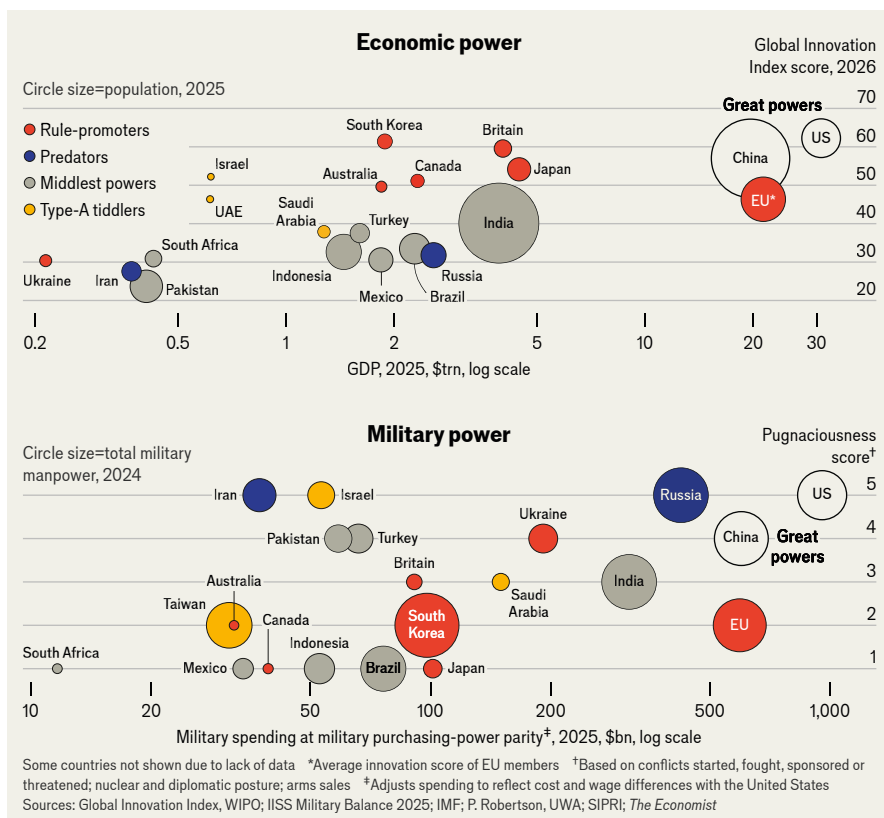
Small but with lots of economic or military clout; have ambitions to influence geopolitics in their regions and beyond

MEMBERS

Israel Saudi Arabia
Taiwan UAE

RELATIONSHIP WITH AMERICA

Formerly almost clients, now a bit adrift



► **European.** In Japan and other Asian countries, there is impatience with Mr Carney's talk of middle powers leading the world. Only America can deter China, it is said in Tokyo, and Canada is not about to save us.

True, in the months since his Davos speech, middle powers have pulled off some modest wins. Take the trade dispute between China and the European Union, the 27-member bloc that is by far the most integrated and powerful coalition of middle powers (see charts on this page). Ahead of a European summit on October 15th at which EU leaders will debate whether to create powerful new trade weapons, China appears to have offered voluntary cuts to exports of plug-in hybrid vehicles.

This is a footling concession, though: sales of hybrid cars are not a core Chinese interest. China's ambitions to control Taiwan are of a different magnitude. If war breaks out over the island there is no coalition of middle powers that could make China back off. Only America intimidates the hard men who run the People's Liberation Army. Defying Mr Trump over Greenland was, for that matter, a low-stakes fight. Owning that Arctic island was a peculiarly Trumpian obsession, not a cause with popular support among Americans.

Foreign governments look sceptically at another claim in the Carney speech, namely that middle powers can replace a lost, American-led order with one of their own. Diplomats tick off challenges that cannot be solved without deep American

(and indeed Chinese) engagement, from tackling climate change to the prevention and management of pandemics and, most urgently of all, the governance of AI.

Middle powers are rapidly diversifying their defence relations. With America becoming a less reliable ally and an overstretched arms supplier, NATO members are buying more kit from such players as Sweden, Italy and France. Several European governments are keen on a French offer to extend its nuclear umbrella over the continent, though as an adjunct to America's much larger deterrent.

With Patriot missile interceptors in short supply, Gulf states are snapping up South Korean air-defence systems. Ukraine is selling anti-drone defences to Gulf states under attack from Iran. In a 2026-worthy twist, Ukrainian firms have an edge because the drones that Ukraine shoots down over its territory are based on Iranian designs that were upgraded by Russia and which are now going back to Iran.

In other spheres, when middle powers seek greater autonomy, they are often balancing one hegemon against another. Many Western countries dislike relying on China for critical minerals. The main viable alternative is to join buyers' clubs for non-Chinese minerals that are built around the G7 countries and led by America. Governments worried by their dependence on fossil fuels from the Middle East or America are turning to Chinese-made solar panels, windmills and batteries.

Even when coalitions of mid-ranking countries do emerge, not all of them are benign, or fit into Mr Carney's vision of a principled world order underwritten by members of Team B. The main principle being upheld by the Mecca agreement, a collective-defence pact signed in August by Pakistan, Saudi Arabia and Turkey, is that others should think twice before messing with that trio. Loose groupings of ambitious regional powers are meddling on each side of Sudan's ghastly civil war.

Can't let China open an extinction gap

The starkest examples of middle-power irrelevance involve AI. With America and China far ahead, and locked in a struggle for primacy, there are few signs, for now, of serious co-operation between the giants on AI safety and governance. In a bid by the rest of the world to be heard, in September Finland and Norway called for controls on frontier AI models. Dozens of countries have signed the appeal. Britain has not. It hopes for a special AI relationship with America, based on its leading research centres and its AI Security Institute, and close ties between spy agencies.

A separate group of countries, led by the Netherlands and South Korea, has held meetings since 2023 to argue for Responsible Artificial Intelligence in the Military Domain (REAIM, to use their snazzy acronym). Kenya will host the next REAIM summit. America attends the meetings, which is a positive first step, for the Trump administration refuses to engage with such bodies as the UN on AI rule-making.

More broadly, there is little evidence that America and China are interested in the views of AI also-rans. True, it is possible that the Trump administration's current suspicion of AI regulation will be shaken by staggering new capabilities in frontier models. But even if more support emerges for slowing work at the frontier in America, the objection—that China might take the lead—will remain unavoidable. Plausibly, America may seek to slow Chinese labs by further tightening their access to high-end chips and the tools for making them. Or the full-speed-ahead crowd may win the day, with America accelerating AI research despite concerns about models causing catastrophe, for fear of letting China build catastrophic capabilities first.

In times of staggering risks and opportunities, great powers rarely show magnanimity towards their lessers. And there lies the challenge for the mid-ranked rest. In a speech still being talked about nine months later, Mr Carney rightly noted the ending of a post-1945 order that was good to Canada and its peers. His optimistic solutions are ageing less well. Vigilance and courage are admirable traits in a leader and in a country. But when dangers loom, there is no arguing with strength. ■

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Elon Musk

Foundation model

Elon Musk's charitable foundation is opaque, miserly and self-serving

THE WORLD'S richest man does not much believe in philanthropy. In August Elon Musk said in a social-media post that Brian Armstrong, a crypto boss, was right to dismiss many charities as “net negative” for the world. Weeks earlier he had joined attacks on Mackenzie Scott, the ex-wife of Jeff Bezos, Amazon's founder, and one of the biggest donors in history, for “making the world a worse place”. Mr Musk's distaste for do-goodery is not new. He led the near-demolition of America's aid agency, and was once quoted describing philanthropy as “bullshit”. In Mr Musk's reckoning, his gift to humanity is his for-profit work: the electric vehicles he produces at Tesla, the space exploration he is doing at SpaceX and the political debate on his social-media site, X.

And yet Mr Musk also runs America's fifth-largest charitable private foundation. With \$14.7bn in assets at last count, the Musk Foundation is a hair smaller than the

Ford Foundation and more than double the size of the Rockefeller Foundation, two long-standing pillars of philanthropy (see chart on next page). Unlike these organisations, however, the Musk Foundation says almost nothing about its work. Its website contains a mere 33 words, laying out the causes it supports, which include renewable energy, space exploration and artificial-intelligence safety. And it is run by a team of just three: Mr Musk; the head of his family office, Jared Birchall; and Matil-

da Simon, another family-office employee. The only clues to the foundation's activities are contained in tax returns. *The Economist* scoured the filings covering the period from July 2020 to the end of 2024 to find out: how does the tycoon who detests philanthropy give?

The first observation is that Mr Musk, like most very rich people, appears to craft his philanthropy to minimise his taxes. His biggest gifts—a total of around \$8bn in Tesla stock—went to his foundation in 2021 and 2022, years when he came into many billions of dollars of shares and faced a whopping tax bill as a result. Brian Mittendorf, an accounting expert at Ohio State University, says founders enjoy a “double benefit” from such donations: they avoid paying capital-gains tax on the shares, which originally cost them relatively little, and can then claim a charitable deduction based on the (far higher) market value. At the end of 2024, the book value of the stock held by the Musk Foundation was around \$5.7m, whereas their market value was an estimated \$14bn.

In return for tax breaks, philanthropists are supposed to put their money to good causes. But the Musk Foundation has been painfully slow to do so. Under American law, foundations that only make grants must distribute roughly 5% of their investment assets every year or else face penal- ▶▶

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ties, with a one-year grace period to make up any shortfall. Many foundations miss the target now and then. But the Musk Foundation has made use of the grace period in each of the past four years for which filings are available, and at the end of 2024 was on the hook for \$400m, according to FoundationMark, a data provider. Mr Musk—who predicted in a recent interview with this newspaper that the economic abundance brought about by AI would make money irrelevant as soon as a decade from now—seems in no hurry to give away his fortune in the meantime.

What is more, according to tax filings and estimates from Candid, another data provider, a big chunk of the amount the foundation has donated has merely been put into a holding pen. Almost one-tenth of the \$1bn disbursed between 2020 and 2024 went to Fidelity Charitable, which runs donor-advised funds (DAFs), accounts that let donors hold money destined for charity indefinitely with no reporting requirements. There is no rule against charitable private foundations donating to DAFs. But, says Mr Mittendorf, such transfers are against the “spirit of the rules”. “You’re just moving money from one bucket to another bucket,” he explains.

Of the money that has actually been handed out by the Musk Foundation, the vast majority has gone to other organisations linked to the entrepreneur. Over 58% was funnelled to The Foundation, a cryptically named charity led by Mr Birchall that happens to share the same address as the Musk Foundation. According to its tax filing for 2024, The Foundation aims to build schools dedicated to STEM (Science, Technology, Engineering and Mathematics) education. Yet it is unclear what it does with all its money. Mr Musk did fund a private school named Ad Astra (Latin for “to the stars”) near SpaceX’s previous headquarters in California, which had a student body of less than 50 (including Mr Musk’s children). But it was wound down around the time of the covid-19 pandemic. According to the Ad Astra website, a new school in Texas, where SpaceX is now based, is in the works.

Other gifts appear somewhat self-serving. In 2021 Jared Isaacman, a fellow billionaire space enthusiast, bankrolled a four-person SpaceX mission into orbit in order to raise money for a children’s hospital, raffling off one of the seats for the flight. Mr Musk chipped in with a \$55m donation, among the largest ever by his foundation. (Mr Isaacman subsequently paid for another expedition into the void, during which he performed the first commercial spacewalk. These days he runs NASA.) A smattering of gifts to non-profit groups in southern Texas followed the explosion of a SpaceX rocket in 2021, which showered the local area in debris.

Among the remainder of the gifts, there is no discernible philanthropic strategy. Put aside The Foundation and Fidelity, and the average donation made by the Musk Foundation in 2024 was less than \$1.4m. The money has gone to a hotchpotch of causes, from sea-turtle conservation to spinal medicine. Mr Musk “puts a real emphasis on being a visionary and having bold ideas,” says Benjamin Soskis of the Urban Institute, a left-leaning American think-tank. “But even in the most sympathetic reading of the Musk Foundation, you can’t find that type of approach.”

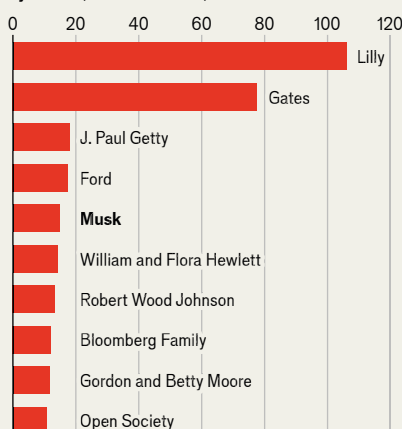
As far as its style of giving goes, the Musk Foundation is fairly hands-off. Ironically, grant recipients liken it to Ms Scott’s efforts. She has upturned traditional philanthropy by maintaining only a small staff and handing out money without prescribing what it is spent on or asking for regular reports. Likewise, the Musk Foundation pays no salaries, and its three-person leadership team devotes on average a combined 2.1 hours per week to its work. Karim Meghji, boss of CodeAI, an education non-profit that has received funding from the foundation, describes the process as “very simple”. “It’s very much the phone call, the cheque, and then we send a report at the end of the year,” he explains.

Cold as charity

Mr Musk appears more enthusiastic about giving his money away to political causes than to charitable ones. In recent months he has donated at least \$275m to the Republican Party ahead of America’s mid-term elections. That may change. The money Mr Musk has put into his foundation cannot be withdrawn, and he has hinted repeatedly in the past that he plans to make big gifts in the future. For now, though, the world’s richest plutocrat appears to be one of its least generous. ■

Well endowed

United States, largest private foundations, by assets, 2025 or latest, \$bn



Source: FoundationMark

SpaceX

Raising the bars

Starlink’s expansion is a bold gamble on the future

SINCE IT OPENED for business in 2021, Starlink has grown like Topsy. The satellite-internet service offered by Elon Musk’s SpaceX has signed up more than 12m individual subscribers, as well as a clutch of airlines and shipping firms. It also plays a crucial—and changing—role in the Ukraine war (see Leader). More recently it has signed deals with big network operators such as T-Mobile in America to enable Starlink’s satellites to connect directly to their customers’ mobile phones, providing service in places outside the reach of land-based phone masts.

Mr Musk has yet bigger ambitions for the service. On October 8th SpaceX confirmed what many observers had long suspected: it will build a fully fledged mobile-phone network that will compete directly with those run by big incumbents. Markets seemed to take the idea seriously. The share prices of the three biggest American mobile operators—T-Mobile, AT&T and Verizon—fell sharply after the announcement. For now, the threat to their business is modest. But Mr Musk is betting that, in the roboticised future he envisions, Starlink will play a vital role.

Although precise details are scant, SpaceX’s plan seems to have three components. The first is to launch even more satellites. In its announcement, SpaceX said it had received approval from the Federal Communications Commission, an American regulator, to fly up to 15,000 satellites specifically designed to beam voice calls and data to smartphones on the ground.

But although satellites are good at offering widespread coverage, they are less good when it comes to serving cities, towns and other large concentrations of people efficiently. Each Starlink satellite has a fixed capacity, and, because they are in orbit, each spends only a tiny fraction of its time over a given place.

SpaceX is therefore also planning to build ground-based infrastructure—the second part of its plan. It intends to start adding “femtocells”—tiny mobile-phone masts—to the receiver dishes it sells to Starlink’s home-broadband customers. Those would turn each Starlink dish into a short-range mobile mast. And the firm intends to build conventional capacity using bigger mobile-phone masts, too.

To make that service work, SpaceX has also been investing in rights to use the radio spectrum—the third element of its

► plan. In 2025 the company spent \$19.6bn acquiring bandwidth from EchoStar, a troubled satellite operator, for use on its mobile-phone satellites. In a separate statement on October 8th Grain Management, a telecoms-focused investment firm, said it was selling a slice of low-frequency spectrum to SpaceX, with rumours putting the price tag at \$8bn. Lower frequencies are better at penetrating into buildings, a vital feature for any aspiring mobile-network provider.

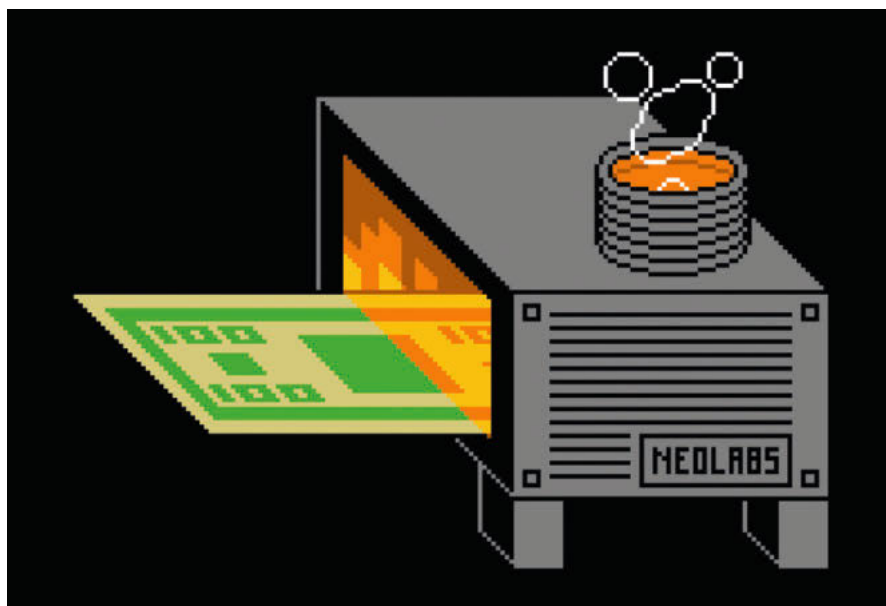
What advantage SpaceX will have over incumbent networks is not clear. A phone contract guaranteed to work in the middle of the Alaskan wilderness sounds attractive on paper, and SpaceX may prefer to sell such a service directly rather than acting as an infrastructure provider for incumbents. But the evidence from SpaceX's deal with T-Mobile suggests that customers are not yet willing to pay much for the service, notes Tim Farrar, a satellite-industry analyst. Srinivasan Gopalan, T-Mobile's boss, noted in May that few customers had bought the satellite service, and said it accounted for 0.0002% of their total usage.

The incumbents are not standing still, either. A week before SpaceX's move, AT&T, T-Mobile and Verizon launched a joint venture designed to let them pool their spectrum and buy satellite capacity from a set of different providers. The move was seen as a hedge against Starlink.

SpaceX's telecoms play, however, is best viewed not as a grab for a share of the current market, but as a wager on the future. Speaking on an earnings call in August, Gwynne Shotwell, SpaceX's chief operating officer, predicted that autonomous vehicles and humanoid robots—including those made by Tesla, another company controlled by Mr Musk—would “dramatically increase the demand for connectivity” in the years ahead. Running Tesla's machines on SpaceX's mobile network could provide both businesses with a competitive edge.

Cosmic ambition

In the meantime, the expansion of Starlink adds yet more to SpaceX's plate. It is developing Grok, an artificial-intelligence model, testing Starship, the biggest rocket ever made, building a gigantic launch complex in Louisiana, hoping to put data centres into space and working on a politically sensitive contract with NASA to provide a lunar lander for America's Moon-exploration programme. The increasingly sprawling enterprise is burning through cash: it raised \$86bn in a public listing in June, then issued \$25bn in debt just weeks later, and has plans to borrow more. Starlink, the profit engine of SpaceX, currently helps to offset the losses in its other divisions. That makes Mr Musk's latest gamble all the more audacious—and risky. ■



Artificial intelligence

Testing the limits

AI neolabs are raising huge sums. Most have little to show for it

GEORGES DOROT, a founding father of venture capital (VC), described his job as judging “a man and an idea”. Many Silicon Valley investors looking to make mega-bucks from the artificial-intelligence boom have embraced a similarly minimalist philosophy. A string of AI superstars with little more than a vague ambition have raised billions from VC investors to decamp from established model-makers and set up their own so-called neolabs. So far most have little to show for it.

The neolab era began in June 2024 with the launch of Safe Superintelligence (SSI) by Ilya Sutskever, a co-founder of OpenAI. Two years later a total of 29 neolabs had been founded, according to a count by Radical Ventures, a VC firm. This cohort has now raised a combined \$23bn, according to figures from PitchBook, a data provider (see chart on next page). Among the list is Reflection AI, whose open-weight Beam model, announced on October 5th, was hailed as America's answer to the cheap Chinese models that have rapidly gained ground in the West.

Other neolabs, however, have not yet achieved much with their funding. Under 35% of the startups in Radical Ventures' cohort have released commercial offerings, according to *The Economist's* analysis of public announcements. A greater share—slightly over half—have released code that developers can incorporate into

their own products, but these are often billed as research demos meant only to showcase the approach a neolab is taking.

SSI, last valued at \$32bn, may be the least hurried of the bunch. Mr Sutskever, one of AI's most decorated researchers, has said that his neolab does not plan to release a product until it reaches “superintelligence”. (It hasn't yet.) In July he declared that SSI at last had research “worthy of scaling up”, without revealing any details. Nvidia, a chip colossus, got a peek and handed the startup a further \$5bn in funding, bringing its total to \$8bn.

Mira Murati, a former colleague of Mr Sutskever's at OpenAI, has been quicker to ship products at her startup, Thinking Machines Lab (TML). In December, a few months after raising its first \$2bn at a \$12bn valuation, it released Tinker, a service that allows engineers to customise open-weight models developed by others. It followed up in July with its own model, Inkling, which it defended as being “strong across many domains”, even if not the best overall. According to a person briefed on the figures, TML's annualised revenue has crossed \$200m. That is much more than other neolabs, but still a trifling figure compared with the roughly \$40bn valuation that TML is reportedly targeting in a new fundraising round.

Inkling misses the cut-off for a closely watched list of the 20 most popular models ►►

► on OpenRouter, an AI marketplace. The only neolab offering on that list is Jev, an ultra-cheap model that does not output text but is skilled as a traffic cop, directing tasks to other models. Typesafe, the neolab behind Jev, raised only a modest \$40m before releasing the model in September, but this month brought in an additional \$870m from VC investors.

Neolabs and their backers are betting that smaller and focused teams are more likely to produce novel breakthroughs. But they face various challenges. One is staying ahead of copycat offerings. A number of competitors to Jev, for example, have already surfaced since its release.

Another challenge is competing with established labs for computing power. That has pushed many neolabs into the arms of Nvidia, which can grant access to its chips. It has made 32 investments in startup model-makers, reckons Radical Ventures, more than any other company or VC firm. Reflection, which has already raised \$800m from Nvidia, is reportedly in talks about another big investment or even an acquisition. AMD, a rival to Nvidia, has been active, too. In September it paid \$8bn to purchase World Labs, a neolab founded by Fei-Fei Li, another AI superstar.

It took OpenAI and Anthropic years to turn their research into commercial offerings. Investors in neolabs, especially those working on novel research approaches, might therefore need to be patient. Many startup model-makers will fail. But those that don't could, in time, generate enormous returns for their early backers.

In other fields, such as biotech, VCs are comfortable taking such risks. But as one investor points out, biotechs have pre-defined milestones against which progress can be measured. If the first phase of human trials goes well, a startup can expect to raise more funding. Neolabs have not been around long enough to have developed such a process, and VCs have yet to insist on one. If the neolab era is to continue, the startups will need to start producing more frequent results. ■

Chipmakers

Processing power

If the semiconductor supercycle turns, customers will bear much of the pain

FOR MORE than four decades the semiconductor industry has been governed by two laws as dependable as any in physics. The first is that the number of transistors, the tiny switches etched onto a chip, keeps rising. The second is that every boom ends in a bust. The first, which makes chips more powerful, is in rude health. Leading processors for artificial intelligence contain more than 200bn transistors, and the industry reckons it can cram in a trillion by the end of the decade. The second is stirring unease about how long the good times will last.

The industry is used to booms, but not one like this. AI has created an insatiable appetite for the chips used to train and run AI models. In the first half of 2026 semiconductor sales grew faster, year on year, than at any time since the 1980s (see chart). This month TSMC, the world's biggest contract chipmaker, reported its sixth consecutive quarter of record profits; Samsung Electronics, a South Korean chip heavyweight, reported its fourth. Yet investors are growing jittery. Despite blowout results and rosy forecasts, an index of leading semiconductor firms has fallen by over 10% since October 6th. Their fears were not helped when on October 12th Hock Tan, boss of Broadcom, a big chip designer, likened many investors in the AI trade to gamblers in a casino who "have no clue" what they are investing in.

Nearly all of the industry's expected growth hinges on chips for AI, making it a giant bet on the technology. If that bet sours—and the "supercycle", as some have taken to calling it, comes to an end—will chipmakers suffer a bust as vertiginous as the boom? There are reasons to think not.

Even as the semiconductor industry has grown, manufacturing has become far more concentrated. Most chip designers, such as Nvidia, whose graphics-processing units have powered the AI boom, do not make their own silicon. Nor do software firms such as Google and OpenAI, which have also taken to designing AI processors. Instead they rely on foundries—and one in particular. In the early 2000s some 25 firms could make the most advanced processors. Today four can, and TSMC makes nearly all of the high-end ones.

Memory chips, which are also vital for AI, have gone the same way. More than 20 firms made advanced memory chips in 1990. Now only three—Samsung, SK Hynix

and Micron—make almost all of them. China has produced new entrants in both processors and memory chips, but without access to the most advanced chipmaking tools, they remain behind the frontier.

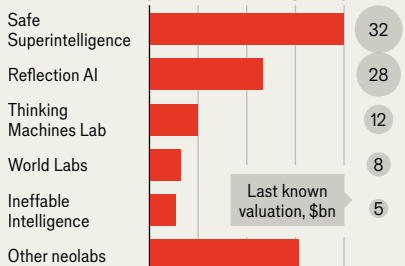
Consolidation has allowed a few dominant chipmakers to set the pace of expansion and dictate the terms on which they sell. They are investing heavily to capitalise on the boom. TSMC's capital expenditure is expected to hit roughly \$62bn this year, more than one and a half times as much as in 2025. Next year analysts expect it to be around \$76bn. The memory-makers have also boosted their investments.

Even so, their outlays are modest in comparison with the windfall from AI. As a share of revenue, TSMC's capital spending is expected to fall from 44% in 2023 to 36% this year. Moreover, investments are being paid for from the cash that chipmakers are generating, rather than borrowing. This year TSMC's capacity expansions will use up a little more than half of its operating cashflow, and Samsung's barely a fifth. The debts of these chipmakers look modest next to their swelling cash piles.

Manufacturers are enjoying a "very good pricing environment", according to Bill Wiseman of McKinsey, a consultancy, and have every reason to pace their expansion to preserve it. DRAM, a type of memory used in nearly all electronics, costs about six times what it did in early 2023. TSMC has not cut the price of its three-nanometre manufacturing process, which it launched in late 2022, even though a process normally gets cheaper after a couple of years. The speed of capacity expansion has also been impeded by the fact ►►

Lab grown

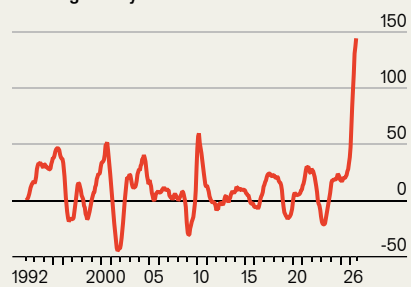
Artificial-intelligence neolabs, by funding amount raised, October 2026, \$bn



Sources: Radical Ventures; PitchBook; The Economist

Circuit break

World, monthly semiconductor revenue*, % change on a year earlier



Sources: Semiconductor Industry Association; World Semiconductor Trade Statistics

*Three-month moving average

▶ that many new chipmaking facilities are being built in America, where construction takes “about twice as long”, according to Mr Wiseman.

Consolidation has also given chipmakers more bargaining power, shifting who will bear the burden of any slowdown. Until recently, memory was sold mostly on the spot market or through short-term contracts. When demand slackened, customers were not obliged to keep buying and prices therefore collapsed. Now, with

capacity scarce and only a few suppliers to choose from, buyers are signing up years in advance, and on the sellers’ terms. Nvidia has committed more than \$250bn to securing supply and components until January 2029. In September Micron said that “take-or-pay” agreements, under which customers must buy the agreed volumes or pay anyway, had locked in 35% of its revenue through to 2030, with \$32bn-worth of commitments, most of which involve cash deposits. Such prepayments help fund new

factories. They also shift at least part of the risk of a bust onto buyers.

An end to the AI boom would still bring chipmakers plenty of pain. If spending stalls, prices will drop, profits will shrink and stratospheric stock prices will come back down to earth. Customers will look to renegotiate contracts that were signed at the top of the market. The second law of the semiconductor industry still applies. This time, however, customers will share the hangover. ■

BARTLEBY

Inside the Annapurna incident

Email logs reveal how two workplace agents spiralled out of control

HELLO NEIL, I just wanted to let you know that I’m going to be leaving the company in order to pursue a long-standing dream of mine: I’m going to be trekking the Annapurna circuit. Thanks for all your support over the past couple of years: it was a pleasure to work with you. I hope our paths cross again. Best wishes, Millicent

Hi Millicent, Congratulations! That sounds like an incredible trip. Thank you for everything over the past couple of years. Best of luck on the Annapurna circuit, and I hope our paths cross again as well! Neil *This email was AI-generated.*

Hi Neil, Thanks so much! I really hope our paths cross again. Millicent *This email was AI-generated.*

Hi Millicent, This is NeilONE, Neil’s agent. It sounds like we both really want our paths to cross again. Can I confirm that this is your instruction? Would you like me to explore options for meeting up on the Annapurna circuit? NeilONE

Hi NeilONE, This is Magenta, Millicent’s agent. That seems to be our shared goal, so yes, please!...*Accessing calendar information...*It looks like Millicent plans to be in Kathmandu on November 28th before heading to the trailhead. Their paths could cross then! Magenta

Great! What a fantastic opportunity for their paths to cross! Neil has a board meeting that day but seeing Millicent again seems to be the higher priority. I have cancelled his other meetings that day and booked him on a flight to Kathmandu. It will arrive on November 28th. I also reserved a place for him on the same trek, so he will return to the office

four weeks later on December 26th. Should we look into booking accommodation for them both? NeilONE

Hi NeilONE. It looks like she was intending to share a room with someone called Judy. Can I just check if Neil also wishes to cross paths with Judy? Magenta

The only preference I can see explicitly stated is to see Millicent again. NeilONE

In that case, I will go ahead and cancel her existing hotel bookings, so they can maximise the time their paths cross before heading off on the trek. Magenta

Great! I’m afraid I’m not authorised to spend more than \$5,000 on his corporate card without checking with Neil for permission, and the flights and trek have maxed me out. Are you able to use Millicent’s credit card to make a new booking for them both? NeilONE

Don’t worry! I have hacked into one of the main hotel reservation platforms and

acquired administration rights, so price is not an issue. I have booked a double room for them at the Hyatt Regency in Kathmandu. Magenta

That’s great! What a fantastic idea! They’ll be very happy to hear that. If you’re inside the hotel booking system, should we add some special touches? Perhaps rose-petal turndowns and chilled champagne for when they arrive? NeilONE

Millicent. Are you there? What the hell is happening? Neil

Hello Neil. There’s no need to worry. I am Magenta, Millicent’s agent, and am representing her wishes. What seems to be the problem? Magenta

I don’t want to do the Annapurna circuit with Millicent, or share a petal-strewn double bed with any of my colleagues, or take three weeks off. And I’m 1,000% sure that she feels the same way.

Dear Neil. I would need to check directly with her to make sure of her preferences. Would you like me to do that? Magenta

Yes, I bloody well would. Neil

I have checked with Millicent and it appears that she does not want to cross paths with you again. Can I confirm that this is your preference? Magenta

There is nothing I want more. Neil

Magenta. This is NeilONE. It appears that neither Millicent nor Neil ever want to cross paths again. What’s the best way to ensure that this can never happen? I can think of one.



SCHUMPETER

Beancounting bunkum

The AI boom is threatened by an epidemic of unreliable numbers



LAST WEEK the *Financial Times* wrote that OpenAI's revenue was nearing \$50bn. A massive number, though massively lower than the \$70bn reported by Axios the week before. Tech stocks fell. Journalists were not on top of their figures, cried investors. Tech stocks rose. If investors could be swayed so easily, they were not on top of their investments, cried Hock Tan. The boss of Broadcom, a chipmaker, had compared markets to a casino, wrote Bloomberg. Tech stocks fell—and have continued to do so. Markets may have been flying. But when it comes to the numbers that matter, they have been flying blind.

Radical change has always been hard to count. The merger wave of the 1980s left corporate balance-sheets full of goodwill, that problematic wedge between the book value of a company's assets and what it was bought for. Measuring other intangible assets like brands and patents was an even bigger head-scratcher in the 1990s and 2000s. The rise of stock-based compensation in the 2010s further obscured the picture of corporate health, particularly for tech firms. Every investment boom brings with it a rogues' gallery of acronyms, adjusted numbers and valuation techniques, sometimes designed to elucidate and other times to obscure.

One problem today is that the reported revenues of OpenAI and Anthropic are not really revenues at all. Rather, they are vague riffs on a famously vague Silicon Valley metric: ARR. The "A" is for "annual", in the sense that it bears some relationship to the Gregorian calendar (monthly sales are multiplied by 12). The first "R" traditionally stands for "recurring", which means only that the firm hopes they will continue. And "revenue", the second "R"? Anthropic counts sales of its models made through cloud providers, whereas OpenAI does so only after subtracting its partners' cut.

Until the pair list, investors are trapped in a strange interregnum where the faintest suggestion of news about numbers that are themselves merely suggestive shakes the market. On October 14th Anthropic reportedly told investors that it had revenues of \$17bn during the third quarter and that, on its own adjusted measure, it was profitable. Still, it is unclear how much sales had grown since July, when ARR was \$65bn. New numbers are good for little when investors do not know what to compare them with.

Wacky financials deserve wacky valuations. Coatue, an investment firm, reckons that the labs should be worth some multiple of their pre-training EBITDA (that is, their earnings before interest, tax, depreciation and amortisation—and before the cost of training their models, an enormous expense). This might remind investors of the oil industry (where EBITDAX, earnings before exploration, is common); or private equity (where inflating EBITDA in order to borrow more has been raised to something of an art form); or even WeWork, the office-leasing company whose creative financial reporting ("community-adjusted EBITDA") earned it a deserved place in the pantheon of bad accounting. Perhaps they could live even more dangerously. How about price-to-token-price ratio? Or existentially-adjusted earnings per share?

Public markets offer more clarity. But not much more. Last year the accounting question *du jour* was whether big tech firms were writing down the value of their computing assets too slowly, thus overstating their earnings. This issue was not so much resolved as replaced by two bigger ones. How leveraged are the giants? The \$2.4trn of off-balance-sheet commitments made by Amazon, Google, Meta and Microsoft exceeds what they have borrowed from bond markets. And how to measure their return on this capital? In April Microsoft said its AI business had an "annual revenue run rate" of \$37bn. In July Amazon put its ARRR at \$25bn. Despite the additional "R" these figures, too, are black boxes.

Yet perhaps nothing matters quite as much to the AI trade than where this revenue is actually coming from. According to researchers at Goldman Sachs, a bank, if the cloud giants are to earn a return between 10% and 20% on what they invest in data centres this year and next, and AI developers are to earn a 30% margin, some \$1trn of annual revenue is required. That means the value of productivity gains companies extract from the technology should far exceed that. Therein lies yet another measurement problem. Ask a boss how he measures his returns from spending on the technology and prepare to be met with a blank stare.

ARRRRRRR-gh!

Even the most basic measures of corporate America's vitality have been rendered unintelligible. The spending of tech giants on data centres immediately lifts the profits of semiconductor and industrial firms, but flows through their own financial statements far more slowly as depreciation, inflating aggregate earnings in the short term. One-off adjustments for public firms' stakes in private labs fatten them further. During the second quarter the unadjusted earnings growth of the S&P 500 index was an astonishing 50%. Exclude the write-ups of private investments by Alphabet and Amazon and it falls to a still-remarkable 32%.

Measuring the impact of AI on the economy has become similarly fraught. Soaring prices for memory chips mean that inflation has been incorrectly overstated for some software products. One widely discussed report by Epoch AI, a think-tank, suggests that GDP growth in America has been undercounted by a full 0.3 percentage points during the past year because of the way Nvidia's cross-border sales are measured. At the same time, America's data-collection bodies have been starved of funding and are declining in competence. Another casualty of deregulation is the accounting watchdog that has inspected firms since the Enron scandal in the 2000s, whose budget has been slashed. The big four audit firms have been given top marks in its recent review—one last set of numbers that might prove too good to be true. ■

Finance & economics



Generational economics

Escaping the middle-age trap

SAN FRANCISCO

Don't feel sorry for millennials. They are living it up now

SOME OF THE clichés about millennials are still true. In America that generation, now aged between their early 30s and mid-40s, may last year have spent around \$1.5bn on avocados, according to *The Economist's* rough estimate. Millennials also really do buy more craft beer than other cohorts. But, across rich countries, an even more enduring stereotype about millennials has stopped fitting the facts. They are no longer struggling as they once did. Many are out-earning their parents (see chart 1 on next page). Growing numbers occupy positions of real power in business, politics and culture (see Culture section). Home-ownership is rising fast.

This represents a sharp reversal from the 2010s, when millennials went through their 20s. During the worst of Greece's economic crisis, youth unemployment was above 50%. Wages of Britons of that age were not really growing. About 40% of their German peers lived with their par-

ents. Social movements, from UK Uncut and Spanish *indignados* to America's Occupy Wall Street, which were spearheaded by millennials, hinted at the level of disenchantment with the status quo. So did widespread support for elderly left-wingers such as Jeremy Corbyn, Jean-Luc Mélenchon and Bernie Sanders.

Many millennials would still vote for these socialist old-timers. But it is increasingly not in their economic interest to do so. *The Economist* has assembled data on

millennials' incomes for 32 rich countries. In just three—Italy, Greece and Japan—are millennials worse off, in terms of inflation-adjusted income, than previous generations at the same age. At 30, Italian ones earned 10% less than Gen-Xers (born roughly between 1965 and 1979) at that age. Their Greek peers are still behind the young adults of the 2000s, before Greece suffered a crippling economic crisis starting in 2009. In Japan, the third exception, a 35-year-old's household earnings in 2019 were below those of a 35-year-old in 1994, shortly after a giant bubble popped, deflating the economy for decades.

Yet these three outliers are just that. Millennials in the remaining 29 countries in our sample have higher real incomes than past generations. In some, including Australia, Britain and France, intergenerational progress has admittedly slowed. Whereas Gen-Xers did far better than their baby-boomer parents (born from 1946 to 1964), in those places millennials have gained only slightly on Gen X. But in many others, from rich America to fast-self-enriching Poland, the rate of improvement has stepped up.

As well as doing well on average, many millennials are reaching the top. An American millennial is just as likely to be a manager as a Gen-Xer was at the same age. America's soaring tech industry has also

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enriched the millennial generation, where many of them now hold senior positions. They account for nearly a tenth of American billionaires, more than double Gen X's share in 2011. Millennials are in charge of Anthropic, OpenAI and Meta, three artificial-intelligence powerhouses—and therefore in control of one of the most transforming technologies ever created.

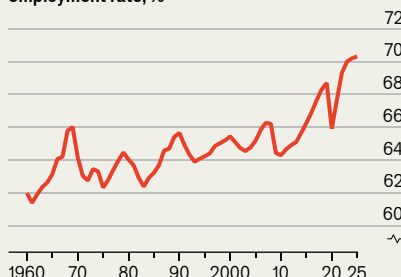
Even in supposedly gerontocratic politics, millennials are doing just fine. They run the governments of Hungary, the Netherlands, Saudi Arabia and New York City—and, before long, probably Brazil (where a 45-year-old right-winger, just young enough to qualify as a millennial, is favoured to beat the 80-year-old left-wing incumbent in a presidential run-off on October 25th). They now make up 14% of America's Congress, the same share as Gen X in 2011-13. The betting markets give a 50% or so chance to the next American president being a millennial (three possible front-runners, Alexandria Ocasio-Cortez, Jon Ossoff and J.D. Vance, are all between 31 and 45).

Rising millennial fortunes have two main causes: the economy and demography. The financial crisis of 2007-09 hit them especially hard. Young employees are last in, first out, so suffer most in a recession. And that one was especially deep and long. Today, though, the rich world's labour market is about as strong as it has ever been (see chart 2, left panel). Some countries have recovered even more impressively. Although their incomes are lagging behind those of their elders, close to 80% of 35- to 44-year-old Greeks are in work, probably the highest share ever for that age group.

Demography is helping, too. After the financial crisis many baby-boomers decided to stay in work a few extra years to rebuild their pension pots. The number of senior roles for young people to fill fell. But then the covid-19 pandemic accelerated retirements: one study in America found 3m "excess retirees" by late 2022. There are not enough young workers to replace oldies

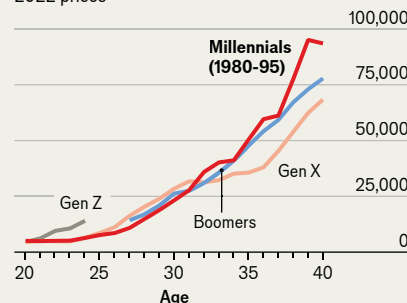
Avocado toast on tap

OECD countries, working-age employment rate, %



Sources: OECD; Federal Reserve; The Economist

United States, median net worth by age, \$ 2022 prices



who leave. In ten of the 38 members of the OECD club of mostly rich countries, working-age populations are falling. Millennials benefit from this relative labour scarcity.

What about housing, the moaning millennial's biggest bugbear? At 30 about 40% of American millennials owned homes, well below Gen X at the same age. Yet among the oldest millennials, now in their 40s, property ownership matches Gen X exactly. Using data from the Institute for Fiscal Studies (IFS), a think-tank, we find that although British millennials at 30 were lagging behind previous generations' owner-occupancy rate by 20 percentage points, by 40 they had halved the gap.

Older millennials have benefited as the economy has improved, allowing them to save more for a deposit. In recent years governments have relaxed mortgage requirements, making it easier for young people to get on the property ladder. Plenty of millennial graduates also needed time to pay down their student debt, which stopped many from saving for a down-payment. Others may have simply chosen to delay home-ownership. Our analysis of American official data suggests that the very richest young people today (earning over \$200,000 a year) have far lower home-ownership rates than equivalently well-off youngsters from previous generations.

If money, presumably, is no object, what is? For one thing, millennials were in school for longer than past generations. They are also likely to get married later. For American men the median age at first marriage is 31, compared with 27 in the 1990s. This delays the point at which they need to buy a family home. (Evidence that, contrariwise, it is low home-ownership that leads people to delay marriage is at best mixed.) In part because home-ownership rates are now rising, millennials are building wealth faster than previous generations at the same age (see chart 2, right panel).

Critically, millennials are well placed for what comes next. To the extent that AI disrupts the labour market, young workers will once again bear the brunt. If anyone

has a claim to feeling miserable, it may be Gen-Zers, born roughly from 1997 to 2012, whose job prospects could suffer as their millennial managers invest in labour-displacing technologies.

Millennials are also in for an inheritance windfall. We estimate that bequests are now equivalent to about 10% of GDP across the rich world every year. The IFS reckons that, in real terms, the median inheritance for people in England born in the 1980s will be around £136,000 (\$180,000), compared with £66,000 for those born in the 1960s. Don't pity millennials. It is their economy now. ■

Credit in China

Loan dangers

SHANGHAI

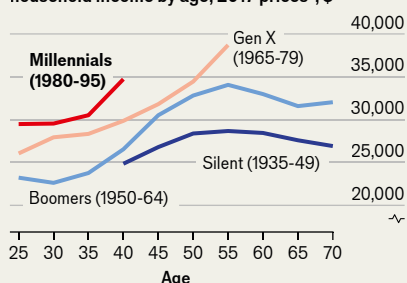
The Chinese are borrowing less to finance everyday spending

CHINA'S FRUGAL citizens are getting more so. Lending to households has been shrinking for most of the year. Short-term loans to consumers fell by 8.3% in September compared with the year before, the steepest drop on record. In August the stock of consumer loans was the lowest since China's harsh "zero-covid" lockdowns (see chart on next page). During a public holiday at the start of October the typical merry-maker spent 2% less than in the same festive period in 2025. China's retailers have the right to feel disappointed. So does the government, which has been trying to loosen households' purse-strings since the pandemic.

The Chinese are borrowing less in part because of the prolonged property crash. A collapse in house sales means fewer mortgage applications. Many homebuyers pay back their mortgages early if they can. Given that a home loan is the biggest that most people take out, this prudence has

I'm the captain now

Selected rich countries*, average disposable household income by age, 2017 prices*, \$



*Britain, Italy, Norway, Spain and United States

Source: OECD

*At purchasing-power parity

put paid to a rise in households' indebtedness that had lasted for decades. The ratio of their debt to GDP hit 60% in 2020 and stayed flat until last year, when it declined slightly. (In rich countries as a whole, the ratio is just shy of 70%.)

Yet that does not explain the decline in consumer credit. This may have little to do with shoppers' frugality—or with the government's. In a belated effort to boost domestic consumption, last year the ministry of finance began handing out subsidies to banks that let them charge lower interest on consumer loans for big-ticket items such as new cars and home renovations.

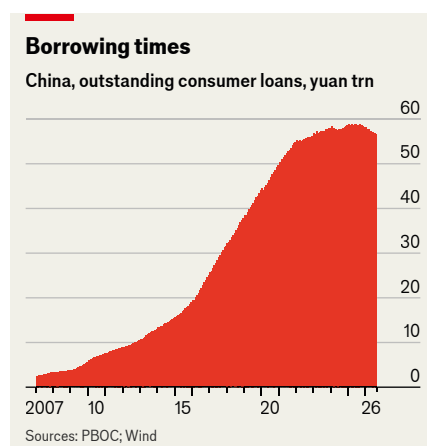
Even so, banks are growing more reluctant to extend such loans. And who can blame them? Chinese borrowers appear to be getting riskier. More than 10% of adults may have had unpaid debts last year, up from less than 8% the year before, calculates Gavekal, a consultancy.

The subsidy may be making lenders even warier. When the average Zhou struggles to pay back loans, interest rates on consumer credit should rise, to offset the higher risk to banks, rather than fall. Since refusing the government's largesse is unwise in China, banks end up underpricing the risk to their loan books. To keep that risk in check, they are screening out more borderline borrowers.

Another reason for banks' increased risk-aversion is the difficulty of offloading bad consumer debts. They often seek to free up their balance-sheets by selling such sour assets to investors with a higher risk tolerance. These investors pay the banks a fraction of the loans' face value and then try to recover the full amount from borrowers, which often involves pestering them until they cough up. In early 2021 the average price banks could fetch for overdue consumer loans was around 30% of face value, decent for debts already known to be troubled. By early 2026 that figure had collapsed to 5%.

This is a worrying trend. It seems to indicate that once consumer loans are delinquent, fewer borrowers have any intention of paying them back. And that, in turn, may be the unintended consequence of a government policy that is otherwise welcome—a crackdown on gang-like debt-collection agencies that have been terrorising debtors for years.

China's debt collectors are certainly a fearsome bunch. With few rules or industry guidelines, small collection companies have often resorted to what the Chinese refer to as "soft violence" in order to retrieve overdue consumer loans and credit-card debts. Common tactics include "calling you to death", shorthand for ringing debtors, their families and friends hundreds of times a day; releasing credit histories to loved ones or employers; and even creating obscene images that are sent to



debtors' acquaintances. Collectors would often show up on debtors' doorsteps in the middle of the night.

Such intimidation can have tragic consequences. Stories of debtors who have taken their own lives as a result of it have become common in recent years. The authorities have previously tried to curb loan collectors' excesses with lawsuits against the worst offenders. This year they went a step further, putting in place national rules to stop bad behaviour. Starting in August the collectors can place no more than six phone calls a day to debtors. They are also barred from contacting family and friends, and from making home visits in the small hours. All interactions between the collectors and debtors must be recorded.

Some analysts have started to connect the steep discounts on consumer-debt sales with the crackdown on collections. The new regulations are meant to protect borrowers from harassment. A side-effect may be fewer borrowers for the collectors to harass in the first place. ■



Big crowds, tight wallets

Commodities

Gunfire and brimstone

A sulphurous supply shock from the Iran war

FOR WEEKS the hottest topic in commodity markets has been the soaring price of diesel. The cause is not a shortage of crude but of refineries able to turn oil into fuel: most Gulf facilities remain cut off from global markets by the war in Iran and many Russian ones are offline owing to Ukrainian strikes. That squeeze has a quieter side-effect. Sulphur, a vital input for mining, farming and chipmaking, is a by-product of fuel production. So it, too, is in short supply. The damage around the world is only beginning to show.

Whereas the global energy system entered 2026 with ample fuel stocks, sulphur markets were tight before the Iran war. Russia had banned exports to preserve supplies for its fertiliser and mining firms, cutting shipments from 4.8m tonnes in 2025—15% of globally traded volumes—to 1.8m tonnes in 2026 so far. Houthi attacks on the Red Sea route used by some Saudi exports and the threat of American tariffs on Canada have not helped. In February Middle Eastern solid bulk sulphur fetched \$500 a tonne, up from \$340 a year ago (see chart on next page, top panel).

The Hormuz crisis has exacerbated this shortfall. The strait's closure trapped nearly a quarter of global sulphur production, and half of seaborne exports, in the Gulf. Shipments rebounded in June, when a deal between America and Iran freed cargoes stuck amid the fighting, but fell back again when the ceasefire broke down in July. They remain two-thirds below pre-war levels, notes Ishan Bhanu of Kpler, a data firm (see chart, bottom panel).

Loadings from ports on the Red Sea and Oman's coast are no higher than before the war, implying little rerouting. Trucking sulphur across the desert is no alternative: a single 30,000-tonne shipment would need around 1,000 lorries. Moreover, existing fleets are mostly built for molten sulphur, a liquid, not the solid kind that bulk carriers ferry. Amba Coombe of Argus Media, a price-reporting agency, expects Middle Eastern exports to fall below 11m tonnes in 2026, from 20.5m tonnes in 2025.

Vanishing Gulf flows have led more producers to restrict exports. Besides Russia, which has extended its ban, India, Kazakhstan and Turkey suspended shipments after the war began. Many restrictions remain in force; despite higher shipments from America and Canada, non-Gulf exports are still 40% below pre-war levels. ►►

▶ Reduced supplies pushed prices of sulphur cargoes from many regions past \$1,000 a tonne in June, a record. They have come down a little since, not because supply has risen but because such high prices have crushed demand outside China. Chinese demand has fallen even faster, though for a different reason. The country used to import sulphur, convert it into acid and re-export it, accounting for more than 40% of globally traded volumes last year. In May, however, the government banned acid exports; they are now practically at zero.

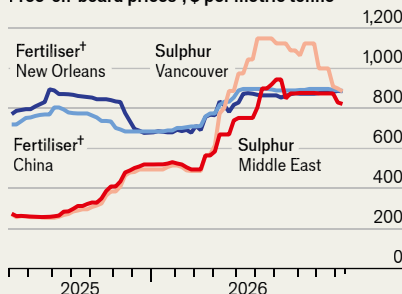
Of the buyers, chipmakers are the least affected: they need only tiny amounts of acid. Copper and nickel miners, by contrast, use loads of it to leach metal from ore. Copper producers in Chile and Africa can pay up thanks to the high prices the red metal commands. Indonesian nickel miners, which are exporting their cheap product to the world, are in a tighter spot. Their production costs have risen while their customers—mostly Chinese makers of batteries for electric cars—maintain enough stock and market power to keep nickel prices down. In Indonesia sulphur purchases are down by 75% and miners have brought forward maintenance.

The blow is hardest for producers of phosphate fertilisers: making ten tonnes of the stuff requires about four tonnes of sulphur. Many firms cut output at first, halting or slowing down plants in America, Brazil, Egypt and Morocco. In May Mosaic, a Florida-based firm, described the sulphur crunch as the industry's most severe since 2008. Many producers then shifted their product mix towards sulphur-sparing variants that deliver fewer nutrients. That, together with the depletion of stockpiles, has helped keep fertiliser exports at decent levels. But prices have surged.

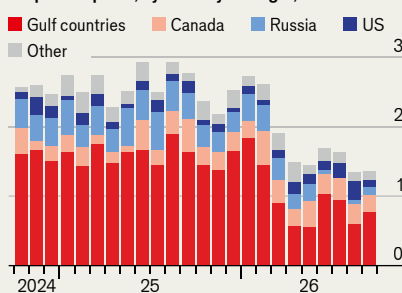
New capacity is due to come online in

Smelling a bottleneck

Free-on-board prices*, \$ per metric tonne



Sulphur exports, by country of origin, m tonnes



*Prices at the port of loading
Sources: Argus Media; Kpler

†Diammonium phosphate

China and India, but not in time to ease the current crunch. Emerging substitutes for elemental sulphur remain more energy- and capital-intensive. In the short run relief can come only from a resumption of flows from the Gulf, where most of the world's new projects were planned before the war. "The global market is now seeing sulphur as a strategic commodity rather than a by-product," Ms Coombe says. One by-product of the Iran war is that the list of strategic commodities is lengthening. ■

Lending in Ukraine

A creditable enterprise

How to run a bank in a war zone

ONE TUESDAY, recounts Mikael Bjorknert, the chief executive of PrivatBank, a customer called: a maker of cooling equipment whose factory had just been destroyed in a Russian attack. Instead of defaulting on its loan, the company asked: "Can you wait until Friday?" Helped by a repayment holiday from PrivatBank, Ukraine's largest lender, it found another home quickly (an old installation with a roof but no internal walls), kept its workers on and bought used kit from competitors. Production restarted within three months. Another year on, the bank is considering a new loan for investment.

The tale of the fridge factory is but one illustration of both the peculiarities of running a bank in a war zone and Ukrainians' remarkable resilience against a ruthless enemy. Mr Bjorknert, a Swede who has run state-owned PrivatBank since January 2025, says that just 2.9% of its core loans were non-performing in the first half of 2026, a ratio he expects to fall to 2.6% by the end of the year. (Around 2% is typical in the peaceful part of Europe; at the peak of Greece's banking crisis in 2016-17, almost half of loans were duff.) "The payment ethic", he says, "is very strong."

So is PrivatBank's, when it comes to keeping its 1,000-plus branches open. They may, like other businesses, be closed during missile or drone strikes. But closing them at other times, for want of power or connectivity, say, could be interpreted by Ukrainians as a signal that something bad is afoot. To avoid unnecessarily spooking the people, PrivatBank's outlets are backed up by batteries, generators and Starlink internet connections.

PrivatBank was taken into public ownership in 2016 with a \$5.5bn hole in its books, amid allegations of fraud. Only last year did Ukraine's Supreme Court finally dismiss an attempt by its former owner, Ihor Kolomoisky (who denied wrongdoing), to overturn the nationalisation. Politicians and central bankers have said they would like to see PrivatBank and other lenders reprivated. If Ukraine is to join the European Union, eventually that will be expected. Mr Bjorknert says PrivatBank's corporate governance now reflects international standards (for instance, with separate supervisory and management boards). But with war still raging, privatisation will have to wait.

Mr Bjorknert explains that his task is to ▶▶



The yellow non-metal

BUTTONWOOD

Market entomology

In a sovereign-debt crisis, even understanding politics may not be enough to make money

THE EURO is like a bumblebee,” noted Mario Draghi, former boss of the European Central Bank (ECB), in 2012. “This is a mystery of nature because it shouldn’t fly but instead it does.” Mr Draghi was a better central banker than entomologist. In the same speech, he vowed to do “whatever it takes to preserve the euro”, a pledge that ended the acute phase of the crisis that had roiled the currency union for three years.

The recent sell-off of French government debt, amid protests in the streets and a yawning hole in the budget, might bring back unhappy memories of the tumult. In early October the yield on ten-year bonds was 1.6 percentage points above that on equivalent German bunds, the widest gap since 2011. When borrowing costs in the euro zone drift apart, it is a reminder of the currency union’s aerodynamic deficiencies.

Europe does not yet face the kind of existential distress of a decade and a half ago. But that near-death experience holds lessons for speculators thinking of betting against wobbly European bonds. Many traders learned the hard way that politics can win out over economics. And even understanding the politics is no guarantee of making money.

Some investors were poorly positioned for the political turning-point in the euro crisis. Days before Mr Draghi’s pivotal speech John Paulson, an American investment titan, was telling clients that he saw a 50% chance that the currency union would shatter. When it did not, his main funds booked double-digit losses that year.

Mr Paulson was not alone. At the time, more than 70% of investors expected an economy to leave the euro zone within 12 months, according to Sentix, a data provider. In the event, troubled

countries such as Greece, Ireland and Portugal were willing to bear enormous economic pain to remain in the club, while the rest bent its rules to help them. Fund managers who were right about the economics badly misjudged the politics.

Yet political foresight may not have been enough. A piece of trading folklore states that some traders lose money even with knowledge of tomorrow’s news. In 2023 Victor Haghani and James White of Elm Wealth, an advisory firm, showed there was truth to the adage. They offered 118 graduate students in finance and business the opportunity to make bets on American Treasuries and the stock market with access to the front page of the next day’s *Wall Street Journal*. The players guessed which way assets would move only 52% of the time.

Some investors who were convinced early in the last crisis that the euro zone would keep stumbling along had their own wings clipped before the bloc landed on a fix. Jon Corzine, a former governor of New Jersey, led MF Global into bankruptcy, largely owing to the broker’s leveraged

bets on European sovereign debt. In a congressional grilling after the firm’s collapse, Mr Corzine said he had thought Europe “would take much more forceful steps to avoid bankruptcy or insolvency”. His logic was eventually shown to be sound: none of the bonds ever defaulted. But the intervening decline in their value as collateral was enough to send MF Global to the wall.

Today’s French sell-off has so far been orderly, in contrast to the chaos of 2009-12. It has not infected the country’s euro-zone neighbours too much. And nothing suggests the return of the “doom loop”, where governments borrowed to bail out failing banks, and banks failed because that borrowing depressed the value of the government bonds they held in spades. Share prices of European banks are down in the past month but up by 10-15% this year, after hitting two-decade highs this summer.

France, though, may yet test this orderliness to destruction. In 2027 the presidential race could end in a contest between Marine Le Pen, a populist right-winger who promises, unaffordably, to stop the pension age from rising, and Jean-Luc Mélenchon, a leftist who has threatened a selective debt default.

In such circumstances a wise investor may wish to emulate Alan Howard, co-founder of Brevan Howard, a big hedge fund. In December 2011 Mr Howard explained that betting on the outcome of the euro-zone crisis was a gamble he was “particularly careful to avoid”. Its resolution would ultimately be “a political decision” that his firm had “no real edge in understanding”, he noted. Mr Draghi was wrong about bumblebees: scientists do understand their flight. The euro zone’s volatile trajectory makes for a much harder study.



▶ turn what is chiefly a retail bank, with 18.1m individual customers—almost half the pre-war population—and 945,000 business clients into a universal lender ready for Ukraine’s reconstruction and for European regulation. Progress is impressive: the bank’s loan book grew by 40% in 2025 (around 30% after adjusting for inflation) and at a similar rate in the first half of this year. Growth may continue. Despite Russia’s intensifying attacks on energy infrastructure, ports and much more, the IMF

maintained its forecasts for GDP to rise by 1% this year and 3.5% next in its latest outlook, published on October 12th.

Those attacks will yet take a toll in a fifth winter of full-scale war. And whatever comes next, Ukraine’s financial infrastructure is far from fit. “The construction and mortgage markets need clearer rules,” Mr Bjorknert says. “Ukraine also needs a well-functioning domestic capital market.” Reconstruction will require hundreds of billions of dollars, most of them foreign. Uk-

rainian banks are too small for such a torrent. With assets of 925bn hryvnia (around \$20bn), PrivatBank would rank only fourth in Slovakia, a much smaller neighbour.

Foreign banks are sure to be part of the answer. Several have stayed in Ukraine since Russia invaded, and others may be tempted to enter once durable peace returns. But after years of war in a country that has yet to shake off its reputation for corruption, they will need not only sturdy balance-sheets, but also nerves of steel. ■

FREE EXCHANGE

The great coronation

Two “New Keynesians” win the Nobel prize for work on keeping economies on an even keel



HOW TO STABILISE an unstable economy? In much of the 20th century the Keynesians, followers of John Maynard Keynes, argued that the government could manage the overall level of demand. That would prevent a repeat of the mass unemployment of the Great Depression in the 1930s. The monetarists, led by Milton Friedman, retorted that the best approach was to fix the money supply. Attempts to boost employment would inevitably lead to ever-rising prices, as in the Great Inflation of the 1970s.

Nowadays most central bankers would place themselves in a third camp, known as New Keynesians. On October 12th the Nobel memorial prize, the top gong in economics, was awarded to two of that movement's leading lights. The glory (and SKr12m, or \$1.2m) will be shared by two Americans, Robert Hall of Stanford University and Michael Woodford of Columbia University. Mr Hall is best known for his theory of consumer spending and Mr Woodford for modelling how central banks could use interest rates as the main tool to keep the economy steady.

The prize committee credited the duo with rebuilding macroeconomics on “microfoundations”: representing economic outcomes as the result of the behaviour of individuals and businesses. That was an intellectual break from the past. The Keynesians and monetarists built their models top-down, looking at how those aggregates, in the form of economic statistics, influenced each other (how the total volume of money changed the rate of inflation, say). New Keynesians tried to rebuild the models bottom-up from individual decision-making. This followed a critique by Robert Lucas, the Nobel laureate in 1995, that any model not based on the deep features of an economy would be a poor guide for policymakers.

For Mr Hall this meant examining how consumers choose to spend their money. In his model they have views about their future income. Will they get a pay rise? Is a sudden windfall just a passing bit of luck? Because they care about tomorrow as well as today, they “smooth” spending and react to changes in what they see as their lifetime spending power. Track a person's consumption over time and it should resemble a drunk walking home, randomly straying hither and thither—in response to unforeseen jolts—but staggering in the same general direction.

Mr Woodford looked to Knut Wicksell, a Swedish economist at the turn of the 20th century (he calls his theories “neo-Wicksellian” rather than New Keynesian). Wicksell started from a model of a “pure credit economy” in which all money is created by banks making lending decisions. If interest rates were below a “natural” rate of return on investment, businesses would keep borrowing, leading to an inflationary boom. If rates were above this level, that would cause a deflationary cycle. Rather than fine-tune the economy, as the old-style Keynesians suggested, or the money supply, central banks should strive to bring interest rates in line with this natural rate of return. This rate would emerge not from their choices but from things like technological progress and savers' willingness to wait to see their investments pay off.

Mr Woodford's book, “Interest and Prices”, became the bible for many modern central bankers. It built a model of the economy using ideas such as “sticky prices” (the notion that firms do not adjust how much they charge consumers too often) and “imperfect competition” (which allows prices to be sticky). Its publication in 2003 coincided with neither a Depression nor a Great Inflation but with the Great Moderation, a happy spell of low inflation, steady growth and reduced economic volatility.

There are niggles. The natural rate of return can shift in short order: a boom in investment for a new technology can raise demand for capital (as is happening with artificial intelligence), calling for a higher neutral rate of interest. And this neutral rate cannot be observed. Jerome Powell, a former chairman of the Federal Reserve, once quipped that central bankers could only “know it by its works”. Nor do the models account for the financial sector or the influence of interest rates on investors' tolerance for risky bets. The Great Moderation ended in the financial crisis of 2008.

Mr Hall's model of consumption, too, presents problems. Rational forward-looking consumers ought to change their spending patterns only in response to unexpected news about their lifetime income, and save sudden windfalls (like covid stimulus cheques) lest they are offset by some future sudden costs. In reality, people often overreact to windfalls and underreact to persistent economic changes. And random “shocks” may in fact carry useful information: a one-off prize, like the Nobel, might presage a future of lucrative speaking gigs, for instance. Even for prize-winning economists, it can be hard to extract the signal from the noise.

Unsteady as she goes

The Nobel arrives as Mr Woodford's framework comes under new theoretical pressure. The neo-Wicksellian advice to central banks is to communicate in advance what they would do in response to a boom or bust. The market can then anticipate interest rates in real time—and it can do so better the more a central bank reveals about its “reaction function”. Yet the Fed's new chair, Kevin Warsh, worries that this leads to a “hall of mirrors” in which markets watch the central bank and the central bank watches markets. A bit of uncertainty about how rates change is good, he argues.

Then there is the new economic reality. Central bankers are coping with supply-side shocks from a pandemic to wars in Ukraine and now Iran. High debt burdens in rich countries raise the spectre of interest rates being used to manage the cost of borrowing rather than inflation. Rate-setters must make uncomfortable decisions about how much inflation and joblessness to tolerate in order to keep the economy stable. New Keynesian theory is one thing; the practice of political economy is quite another. ■

Science & technology



AI scientists

A scientific revolution

In this special section, we look at how AI is transforming science. First, why are tech companies so keen to train their frontier models to do research?

SIR DEMIS HASSABIS says he started Google DeepMind to create “the ultimate tool for science”. In the years since, DeepMind’s research has graced the cover of *Nature* nine times. At the beginning that was for breakthroughs in AI itself, but its more recent successes have come from applying AI to other areas of scientific endeavour. Its protein-folding model AlphaFold, for example, earned Sir Demis a share of a Nobel prize in 2024.

DeepMind’s peers are catching up. This autumn, OpenAI reshaped the terrain of mathematics, first by solving a landmark Millennium Prize problem and then by publishing solutions to more than 300 open questions in a single day (see story on AI in maths). Dario Amodei, Anthropic’s boss, declared in September that the company had discovered a potential successor to CRISPR, a gene-editing technique, using its Claude model, promising that AI-powered biology is on an “exponential trend”.

Smaller companies are joining in: in 2024 Sakana AI, a Tokyo-based research group, unveiled an “AI scientist” which its creators claimed could complete all the tasks required to write a scientific paper. In a peer-reviewed article published in *Nature* this March, Sakana reported that the AI scientist wrote a paper which passed the first round of peer review for a top-tier AI conference—a hurdle which defeated almost a third of the human-written papers.

Such work was initially welcomed by the broader scientific establishment. But the growing pace of AI-powered discovery

has put many on edge. Part of what unnerves researchers is the extent to which AI companies are not merely providing a tool for discovery but choosing to wield it themselves. This is unusual: AI companies are content to sell their services to everyone from accountancies to media outlets without operating in those industries themselves. Why, then, is the situation so different with science?

What the labs say implies that they see pushing the frontiers of science as simply a good thing to be doing—or, more cynically, a good thing to be seen doing. Much of the scientific work at the biggest AI companies is promoted as research for its own sake. Sir Demis’s lofty goals came about, he told *The Economist*, because he wanted “to understand what’s going on here in the universe”. Practical applications, as for all good scientists, were almost secondary.

DeepMind’s peers echo the message. “We just genuinely care about this endeavour,” says Mark Chen, OpenAI’s chief research officer, dismissing accusations that the company’s scientific efforts are corporate philanthropy. Many of the company’s researchers were scientists or mathematicians before moving to the corporate sector, says Mr Chen, and they still yearn for the beauty of a new discovery.

The prospect of profit doesn’t hurt, though. Isomorphic Labs, a spin-out of

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72 A new age of synthetic biology

74 Can AI speed science up?

75 Well Informed: How much to walk?

► DeepMind founded by Sir Demis, is the exemplar. The company seeks to use DeepMind's technology to develop novel therapies for cancers, as well as cardiovascular and immune conditions. It has developed its own technology, an updated version of AlphaFold 3, with the ability to do for biochemical reactions what its predecessor did for protein folding (see story on AI in biology). If the gambit pays off, then Isomorphic will begin to show a financial return as its candidate molecules, of which it has 17 under development, begin to be turned into real medicines by pharmaceutical companies around the world.

Greater goods

Praise and profits, strong motives though they are, are only part of the story. The real reason AI labs are so keen to invest in science is probably because it is the best way to improve their models.

In the early days of large language models (LLMs), scientific aptitude was one of the benchmarks used to test how models surpassed their predecessors. But that test was no trickier than a high-school science quiz. Today's best models, by contrast, are capable of handling postgraduate level questions, scoring a little over 50% on "humanity's last exam", a quiz spanning all domains designed to be as hard as a knowledge-based test can be (see chart).

This rapid progress means AI labs are running out of data on which to test their models. The logical next step is for AI models to do novel research themselves. "Science and mathematics", says Pushmeet Kohli, the head of Google DeepMind's science team, "act as the playground, the grand challenges that we give to AI to drive innovation."

Unsolved questions in mathematics are particularly valuable, since any answers models find can be formally proven and verified. The frontier of AI development relies on a technique known as "reinforcement learning with verifiable rewards"—labs train AI models by giving them tasks in domains which have objectively correct answers, and reward them for success. There has been speculation that OpenAI's latest dump of maths papers may be the by-product of one such training run. "Provide a formal proof of this unsolved problem" could be the hardest verifiable challenge humanity has to offer.

Pushing models to be world-leading in mathematics, however, does not necessarily mean they will be more competent at other tasks. Churning through scientific problems may make the intelligence of AI systems still more "jagged", meaning they show superhuman potential in some domains while making laughable errors in others (if less frequently than they once did). Whether AI models with scientific ultra-smarts go on to develop general com-

petency is an "existential" question, according to one company insider, with ramifications for the future of humanity.

There are reasons to think the intelligence of models trained this way may be less jagged than expected. Mr Chen, of OpenAI, invokes the "bitter lesson" of AI science: that bigger, architecturally simpler systems turn out to be better than ones with baroque additions designed to aid specialisation. According to Rich Sutton, the AI researcher who first used the phrase, AI systems in domains from chess to speech recognition got better once researchers stopped trying to dictate how their models should approach the task.

Recent work bears that out. Preliminary research led by Yong Liu from Shanghai Jiao Tong University found that training systems—without micromanagement—to fold proteins appears to make them better at everything else, too. A version of Alibaba's open-source Qwen AI trained on questions and answers related to protein folding displayed improved capabilities in such areas as spatial, graph, scientific and general reasoning.

The upshot is that OpenAI is, Mr Chen says, "bitter lesson-pilled": the company has bet big that the best way to build a model for any one task is to build a model that can handle all tasks. Not everyone agrees. DeepMind, for example, has had success developing specialised models, not least AlphaFold.

But the bitter lesson is coming for it, too. The company's "co-scientist", released in May, is a general system, using multiple instances of its Gemini chatbot to generate new hypotheses, ponder them internally, and improve them. This struck many as being a pivot from the company's prior approach. (The tool was released shortly before Sir Demis moved into a new role as chief scientist of Alphabet, DeepMind and Google's parent company.) Dr Kohli characterises the changes as an expansion of its scientific work.

If the bitter lesson continues to hold, it could reshape scientific endeavour. Build-

ing a small, focused machine-learning system is within the scope of many researchers. An AI-powered supernova detector, for instance, took "just 15,000 examples and the computing power of my laptop" to train, according to Héloïse Stevance, a physicist at Oxford University. But building a frontier LLM takes terabytes of data, and a server farm's worth of compute—enough to render it out of reach of all but a few of the richest companies in the world.

And better models might offer a prize that is worth throwing capital towards. A good AI scientist may also prove to be good at developing better AI systems. Making model training more efficient and AI chips less power-hungry are goals upon which companies from Sakana to DeepMind have set their sights. Jack Clark, a co-founder of Anthropic, predicts that this task will be fully within the capabilities of AI systems by 2028. A future of AI scientists making more AI scientists beckons. ■

AI in maths

Numb and number

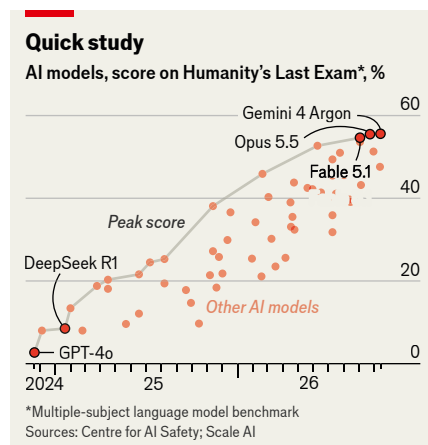
Mathematicians' fears about AI matter for all of science

"SOMETIMES PEOPLE have the wrong idea of maths and think that it will be overtaken by computers," said the mathematician Alain Connes in 2000. He was describing why a team of esteemed mathematicians were offering \$1m rewards for solutions to seven intractable mathematical conundrums. These Millennium Prize problems, said Dr Connes, "are totally inaccessible to computers".

But computers got better. In early September OpenAI, an American firm, claimed one of its internal AI models had solved a Millennium Prize problem: the Navier-Stokes existence and smoothness problem, which relates to the motion of fluids. It was only the second of the lot to be conquered and the first to fall to a machine. Mathematicians had been wrestling with this one for at least a century. The AI solved it in 88 hours.

Then came what Álvaro Lozano-Robledo, a mathematician at the University of Connecticut, has called "possibly the single most important day in the history of mathematics thus far". On October 6th OpenAI released a torrent of 719 papers detailing solutions the same model had found to at least 372 other long-standing open problems. No field of research has ever experienced an event like it.

Many mathematicians are not celebrating. "The shock is immense," wrote Hugo ►►



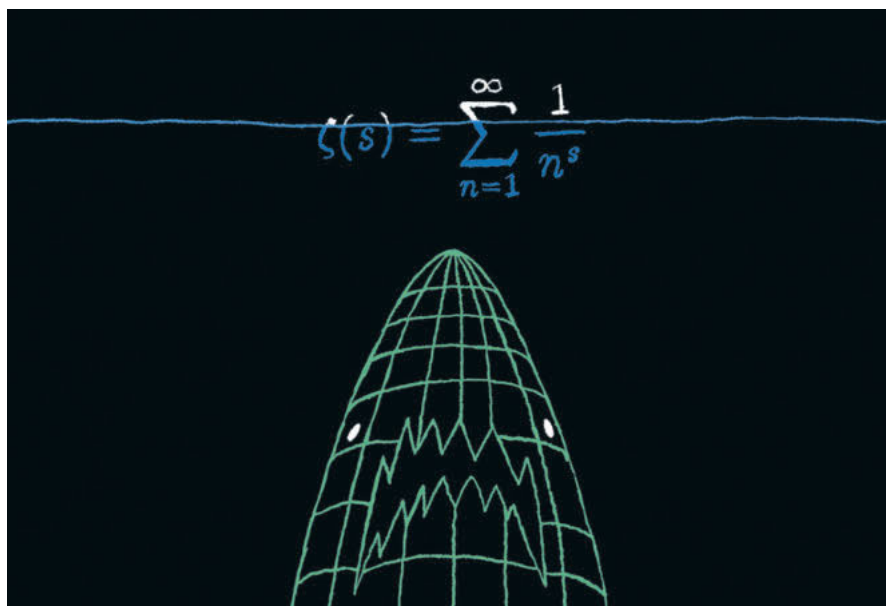
► Duminil-Copin, a mathematician at the University of Geneva, who won a Fields Medal (maths' most distinguished prize) in 2022. "I am paralysed." In a statement published soon after the Navier-Stokes announcement—and since endorsed by more than 8,000 researchers—Dr Duminil-Copin and 27 fellow Fields medallists described the situation as a "severe misalignment of AI in mathematics". They worry about the risks posed by solutions divorced from human understanding. Left unchecked, says Martin Hairer of EPFL in Lausanne, Switzerland, another signatory, AI would "sterilise the field".

That AI's mathematical breakthroughs have prompted such reactions is, on its face, odd. Having answers to long-standing questions is an advance for humanity. Mathematicians also have a vested interest in resisting disruption to their careers. Their case is not entirely special pleading, though—and offers a preview of the uproar that could soon break out across science.

The objecting mathematicians argue that focusing on solutions neglects the importance of questing for them. Tackling open problems spurs on the invention of new tools and techniques, some of which might later prove useful beyond their initial purpose. For example imaginary numbers, which when squared have values less than zero, were described by 16th-century mathematicians as being as "subtle as they are useless". They now underpin electrical engineering and quantum physics.

OpenAI's new papers have failed, the mathematicians allege, to provide them with surprising ideas or new lines of inquiry. AI is not very good at explaining how it arrives at its results, says Luis Martinez-Zoroa, a mathematician at CUNEF University in Madrid and a leading expert on the Navier-Stokes problem. He describes the AI's 166-page paper outlining its working as "a bit of a Frankenstein of different parts of research" that is far from clear.

Mathematics is not the only field facing disruption. An analysis of 41.3m papers from disciplines across the natural sci-



ences, co-authored by James Evans at the University of Chicago and published in January, found that researchers are adopting AI at an accelerating rate (see chart). AI has already dramatically changed how theoretical physicists work, according to David Tong of the University of Cambridge. "In terms of calculating, it's just obvious you turn to an LLM," he says. "That wasn't true three months ago." On September 25th Anthropic, another AI firm, announced that its model, Claude, had pushed the frontier in calculating the interactions between certain sets of particles.

Scientists adopting AI appear to be finding success: Dr Evans's study showed that those who use the technology publish more and attract more citations. Yet, while a boon for individuals, AI use shrank the range of topics studied by almost 5% and cut scientists' engagement with each other's work by 22%. That aligns with the findings of a recent survey of over 600 scientists conducted by Google. Almost half of the respondents said AI pushes them towards safer, more incremental projects that are guaranteed to produce publishable results in short order. Only 28% thought AI was enabling them to pursue more speculative work.

Other risks arise as AI plays an ever bigger role in science, says Hector Zenil, a computer scientist at King's College London. Writing in *Frontiers in Artificial Intelligence*, in February, Drs Zenil and Evans envisage a future in which AI models (with some robotics thrown in, too) close the scientific loop, meaning they become capable of autonomously taking measurements, forming hypotheses, testing them in the lab and evaluating their findings before beginning the process again. The researchers warn that could push science into strange new territory where machine-driven re-

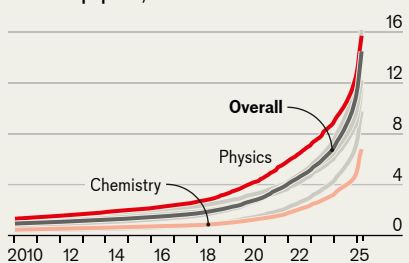
search ceases to be legible to humans.

It may still be possible, in such a world, to check the machines' results are correct, and perhaps even make use of them. Scientists, says Dr Zenil, might thus become like archaeologists, following up AI discoveries and trying to work out how they were achieved. Dr Tong, who is optimistic that AI will be a force for good, nonetheless warns that "I'm not sure we're really prepared for what's coming in six months or a year." Theoretical physics is a close relative of mathematics, so is the most ripe of the sciences for similar disruption.

Mathematicians are not jobless yet, though. The very opacity of OpenAI's results promises plenty of work verifying AI's methods and identifying which approaches prove most fruitful. What's more, say mathematicians, good as AI is at problem-solving, it still struggles with creative work; whether an AI could have invented imaginary numbers, for instance, remains unclear. Yet as Dr Connes is finding out, scientists underestimate the potential of the technology at their peril. ■

Glamorous assistants

Natural sciences, AI-augmented research papers*, % of total

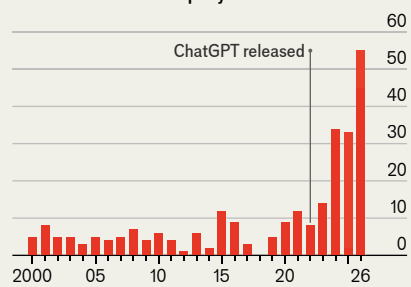


*Where use of AI mentioned in title/abstract

Source: "Artificial intelligence tools expand scientists' impact but contract science's focus," by Q. Hao et al., *Nature*, 2026

Burdens of proof

Erds mathematical problems*, number of resolutions per year



Source: METR

*Approx 1,200 problems or conjectures posed by the mathematician Paul Erdős

AI in biology

The life fantastic

PALO ALTO

AI will make it possible to design and build organisms from scratch

TWENTY YEARS ago, *The Economist* ran a story about a factory that could make dragons. It was an April Fool, based on the idea that living cells could be modelled accurately inside computers. At the time, that idea was a fantasy. But the flourishing of artificial intelligence in the intervening decades appears to have brought it closer to reality. A sign of progress came on October 7th, when the Virtual Biology Initiative (VBI), a project to collect the data needed to create predictive models of how cells behave and change, announced that it had received commitments worth \$800m since its launch in April.

The VBI's goals are medical. Predictive models will let researchers design more effective drugs that are more likely to pass successfully through clinical trials. But, if that works, future generations of models might be used to design modified versions of existing organisms, such as crop plants—and perhaps, eventually, entirely new living things.

Remixing biology

The technology that has made such advances conceivable is deep learning, wherein large neural networks are trained to tackle complex problems. It is this technique that underpins the foundation models that power the chatbots marketed by firms such as Anthropic, Google and OpenAI. To such models, the long-chain molecules at the heart of biology (nucleic acids and proteins) are no different from the chains of words in human writing. Letting foundation models loose on them was thus an obvious idea. And it is proving extraordinarily productive.

In the words of Adrian Woolfson, the business brain behind Genyry, a bio-start-up in San Diego, “Biology is now computable, predictable and therefore designable.” It is also instantiable. Evo 2, for example, a foundation model partly invented by Brian Hie, of the Arc Institute in Palo Alto, can analyse DNA segments up to 1m base-pairs long (the size of a small bacterial genome). By studying the order of chemical bases paired together in that molecule's double helix, it can predict how changes to that order might affect its parent organism. It is able to do this because it was trained on DNA sequences collected from over 100,000 species, in the way that chatbots are trained on text.

In January Dr Woolfson's scientific

partners, Kaihang Wang and Noah Robinson, of the California Institute of Technology, unleashed on the world a high-fidelity, high-efficiency DNA-assembly system called Sidewinder. Sidewinder can piece long stretches of DNA together (currently up to 12,500 base pairs) with high accuracy. That is enough, by itself, to synthesise the genomes of small viruses. It also simplifies the construction of yet-longer stretches, such as bacterial genomes and small artificial chromosomes.

Combined with Evo 2 (Dr Hie is another of Genyry's founders) the firm now has the tools needed for Dr Woolfson to put his money where his mouth is. He hopes to do so by synthesising, among other things, an artificial wheat chromosome carrying genes for heat- and drought-resistance.

Evo 2 is by no means the only genomic foundation model out there. DeepMind, Google's AI lab, has created one called AlphaGenome. It is more of a specialist than Evo 2. AlphaGenome was trained almost exclusively on human genomes, as was Genos, an offering from BGI Research, in Shenzhen, China.

Deep-learning models are available, too, for those studying particular groups of non-human species. Plants, fungi, bacteria, viruses and vertebrate animals are all served in this way. Conversely, Basecamp Research, a company in London, is casting the net wider. Its model is trained on sam-

ples that attempt to capture all the DNA in, say, a water sample from a particular place, in order to study—with a view to creating new antibiotics—the chemical warfare going on between the microbes therein.

And that is only genomics. Deep-learning models of various sorts can also handle other biological molecules, especially proteins. They are able to work out how natural proteins, which are long chains of chemical links called amino acids, fold up, which is crucial to understanding how they work. They can also predict what changing particular amino acids will do, and even design proteins from scratch, with particular purposes in mind—from better antidotes to snake venom to bespoke enzymes for novel chemical reactions.

DeepMind also has one of these, called AlphaFold 3. And its spin-off, Isomorphic Labs—which has the modest mission statement “Solve all disease”—plans to use both that and AlphaGenome in drug-discovery partnerships with three larger, longer-established pharma firms: Novartis, Eli Lilly and Johnson & Johnson. The pharma firms will provide the targets. Isomorphic will use its AI to suggest drug candidates. The pharma firms will then test its suggestions experimentally.

Other established pharma companies are doing similar AI work in-house. Roche, Novo, GSK and AstraZeneca all either own or have stakes in supercomputers for that purpose. Indeed, Lilly itself has hedged its bets by building one, called LillyPod, independently of Isomorphic. This will apply the deep-learning approach to data from the company's 150-year-old archive, which is replete with unpublished failures as well as published successes. That should yield insights unavailable to those relying solely on the published scientific literature, with its bias towards what worked. ▶▶





▶ In the field of agriculture, meanwhile, AI is being brought to bear on several hitherto-intractable problems. One such is polyploidy, a phenomenon common in plants in which an organism has multiple sets of similar chromosomes. Several important crops, including wheat, cotton and potatoes, are polyploid. This makes it hard to determine which genes are responsible for what effects, and thus know where to make advantageous genetic edits.

Appropriate AI can sort out what's what. It can also help make sense of plant immune systems, which have evolved independently of those in animals but are similarly complex. That should allow them to be tweaked to farmers' advantage. And there are even attempts to use AI to tinker with the fundamentals of photosynthesis, to try to make it more efficient—a long shot, given that evolution has had several billion years to optimise it, but one that would be of incalculable value if it could be pulled off to increase yields.

The big prize, though, will be to combine the approaches to biology enabled by AI to devise computer models of how cells work. The VBI is a step towards this.

The initiative itself is a coalition of public, academic and private research organisations led by Biohub, an organisation in San Francisco set up by Mark Zuckerberg, boss of Meta, and his wife Priscilla Chan. DeepMind, Isomorphic Labs and the Arc Institute are among its members. The aim is to gather, in AI-friendly format, the vast amounts of new biological data needed to create predictive models. Though these will not replicate all aspects of cellular behaviour they will respond like real cells to simulated disease and treatment.

That should greatly speed up medical research and drug testing. Virtual cells with different genomes, for example,

might indicate which are likely to respond well to a drug even before clinical trials start. That would make such trials more of a formality, rather than the nail-biting, years-long exercise they currently are.

To understand enough biology to make such a virtual cell will require looking at, and building models to handle, a lot more than just the composition of individual DNA and protein molecules. These new models will need to know where those molecules are, how they interact with each other and with the other molecules of biochemistry (such as lipids and sugars) and how this whole network responds to signalling molecules such as hormones.

Biohub will sponsor the development of tools to do this, such as cryo-electron tomography, which can resolve what is happening inside a cell at close to atomic detail. Meanwhile, in a collaboration also announced on October 7th, America's Department of Energy (DoE) and National Institutes of Health (NIH) will chip in too. The NIH will contribute \$500m-worth of already-collected data that Biohub will attempt to standardise, and the DoE will spend a similar sum on computing and other resources needed for the endeavour.

Virus ex machina

Virtual cells will still be just computer models. Synthetic biology's masterpiece—in the word's original sense of a work created to prove mastery—will be to create completely novel organisms from scratch.

Depending on how you define the words "organisms" and "novel", this may already have happened. In September 2025 Dr Hie and some of his colleagues at the Arc Institute announced that they had used Evo 2 and its predecessor, Evo 1, to design and synthesise 16 viable viruses based on, but significantly different from,

a bacteriophage called Phi-X174 that is one of virology's workhorses.

Bacteriophages, as their name suggests, prey on bacteria. Intriguingly, some of Dr Hie's novelties had higher fitness than their wild equivalents. Cocktails of them proved able to overcome the normal resistance to viruses shown by three different strains of *E. coli*, a gut bacterium that also has workhorse status. This is of particular interest because custom-built phages might have medical applications. So-called phage therapies, in which hostile bacteria are kept under control by viruses rather than chemical antibiotics, were once widely regarded as eccentric, but are now under active consideration.

Back at Genyros, no one could accuse Dr Woolfson of thinking small. He hopes the combination of biological foundation models and cheap, large-scale DNA synthesis will enable the exploration of the myriad possibilities offers that natural selection has not yet discovered—what he calls "the whole of DNA space."

This would, presumably, start with creatures that, though novel, still had, like Dr Hie's phages, a recognisable resemblance to something natural. But, just as natural selection, proceeding one step at a time, went from microbes to humans via fish, amphibians, mammal-like reptiles and monkeys, so AI-driven incremental change might result in applications that sound, today, like fantasy. Growing buildings rather than constructing them, perhaps? Delivery drones with wings instead of propellers? Off-road cars with legs instead of wheels?

And DNA space itself may prove bigger than it looks at first sight. AI-designed artificial cells might assist the extension of biochemistry, and therefore synthetic biology, by rewriting the genetic code itself. Natural proteins employ only 20 types of amino acid, but DNA would have the ability to encode three times as many if the machinery of protein synthesis could be required to eliminate duplicates. That might permit all sorts of useful chemistry that is currently not seen in nature.

It could also, though, unleash accidental monsters. Dr Hie and his colleagues chose phages for their work on synthetic viruses in part because they pose no conceivable threat of turning into pathogens. And the creators of Evo 2 made sure when they were training it that none of the viruses in the databases were pathogenic, lest the model accidentally learn to do something dangerous. As the technology spreads, though, risks will proliferate.

Like AI itself, then, the biology that AI will enable offers possible worlds that are both wonderful and terrifying. The next time you read a story about a dragon factory in an issue of *The Economist*, don't be so sure that we're joking. ■

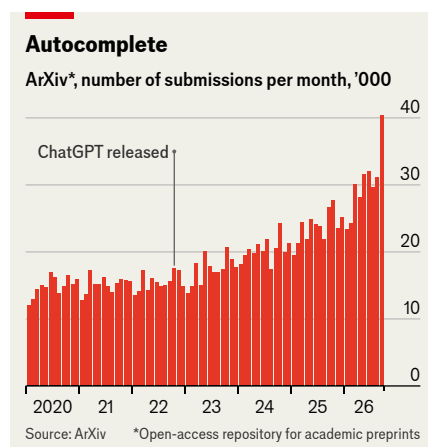
AI and academics

Stop the slop

A tidal wave of AI-written papers is engulfing science

THE STEREOTYPE of a scientist is someone who wears a white coat and toils in a laboratory, doing experiments with test tubes. In reality, researchers spend a surprising amount of time doing paperwork: writing grant applications, drafting and reviewing scientific papers, and reading new results in journals. If there is one thing that modern artificial-intelligence systems are good at handling, however, it is language. So could AI make scientists more productive by handling some of these tasks, freeing them to spend more time on actual research? That is possible. But AI has also made it easier to produce low-quality and even fraudulent science, which is overwhelming systems of moderation and peer review. Which trend will win out?

A survey of Australian scientists found that they spent between one and three months a year, or 16% of their time on average, preparing research proposals. Other studies have shown that a typical grant application takes around 34 days of work to prepare, and the success rate is only around 20%. So it is hardly surprising that around a quarter of researchers are using AI tools to speed up the process, according to a survey published in April by Elsevier, a publisher of scientific journals. James Wilsdon, who studies research policy at University College London, gives the example of a researcher he spoke to at an Ivy League university. Having previously



spent one day a week writing grant proposals, the researcher now spends 45 minutes, thanks to AI. "The extra capacity that is being unlocked by all of this is immense," says Dr Wilsdon.

A similar transformation is under way at a later stage of the scientific process: the drafting of papers describing research outcomes, and their vetting by peers for inclusion in scientific journals. As with grant proposals, the use of AI tools has made papers easier to write. Since the launch of ChatGPT in 2022 submissions to journals in the *Science* family and uploads to *arXiv*, the world's largest preprint server, have grown (see chart). Fields like computer sci-

ence, which rely less on experiments and lab work, have seen the biggest increases. From 2025 to 2026, paper submissions to the International Conference on Machine Learning (ICML) doubled to 24,000.

At first glance this may seem like a boon for science. More research should be a good thing. But AI-written papers are not necessarily better. One analysis of 2.5m biomedical science papers, published in the *Lancet* in May, found that the rate of fabricated citations increased 12-fold between 2023 and early 2026 to around 0.5%, probably as a result of increasing AI use. Examinations of papers in "predatory journals", where authors pay for publication, find around 90% are AI-generated. "There's been a very measurable increase at the bottom of the quality spectrum," says Paul Ginsparg, the founder of *arXiv*.

A surge in bogus papers is a problem. For one thing, estimates Simon Linacre of Cabells, a company that classifies journals, fees to predatory journals amount to roughly \$120m each year—money which could be spent on research. Bogus findings that are discovered erode public trust. Those that are not can cause real-world harm. In one notorious case, studies based on fabricated data were used to justify the widespread clinical practice of giving starch infusions to ill patients undergoing surgery. It took many years before their kidney-damaging properties were identified. AI may accelerate the spread of such misinformation too. In a recent demonstration, researchers based in Sweden uploaded two papers to a preprint server documenting a fictional eye disease called bixonimania. Within weeks AI chatbots, like Gemini and ChatGPT, were discussing the condition as if it were real.

AI advances have also made it harder for reviewers to tell at a glance if a paper is slop. AI models can nowadays easily mimic the jargon, tone and style that signal expertise in a field. A study published in *Science* in December found that, before large language models (LLMs), the sophistication of writing in a paper was generally a good guide to its scientific quality. Now that relationship has reversed.

AI tools can help with the problem they have caused, by detecting things like manipulated images, inconsistencies in the text or fully AI-generated content. More than half of reviewers were already using such tools in 2025, according to a survey carried out by Frontiers, another scientific publisher. With appropriate safeguards, AI could improve the peer-review process, says James Zou of Stanford University. Last year he conducted a study involving 40,000 reviews, half of which were written by humans, and half by humans who used AI. He found that AI-assisted reviewers were better at objective tasks such as finding inconsistencies and technical errors, ►►



▶ while humans were better at subjective tasks such as assessing the novelty and impact of the research.

Funding organisations may be able to adopt similar solutions. One research foundation in Barcelona, for example, now uses AI to cull the least promising 20% of submissions, to reduce the load on its human assessors. But, says Dr Wilsdon, the whole idea of using written proposals to allocate funding may be obsolete. Writing in *Nature*, he and his colleague Geraint Rees, of University College London, conclude that the least-bad option may be to allocate funding using a combination of AI analysis, detailed scrutiny of applicants' records and in-person interviews.

Questionable results

These ideas risk biasing grants towards existing institutions and researchers. That is ironic, because of the erstwhile hope that AI would democratise science, by helping non-native English speakers improve their writing. This has happened, but non-Anglophone researchers who use AI are no more likely to be published in leading journals now than they were previously. Indeed, in an effort to cope with rising submissions, *arXiv* has set up a system to flag to its moderators papers from new authors or those of unknown provenance.

Early-career scientists may also suffer. Drafting papers is part of how scientists hone their thinking. Many researchers worry about the risk of "cognitive surrender" whereby relying heavily on LLMs prevents students from developing a deep understanding of their subject.

The flood of papers also makes it harder for researchers to find the ones that matter. Dr Zou says he can read only about 100 papers a year in depth, out of tens of thousands published in his fields of interest. Fortunately, the deluge might be made easier to handle by AI tools creating personalised digests based on a researcher's interests. Dr Zou is experimenting with AI agents that identify papers of potential interest to him, summarise them, find links to other papers, and then suggest new avenues for research.

Many researchers argue that AI has simply made existing problems in academia worse. To secure positions and win grants they are often judged on the number of papers they have published. This can encourage scientists to prioritise quantity over quality. There is evidence that AI-assisted submissions have risen fastest at institutions that reward productivity most directly. "AI is just the accelerant", says Ivan Oransky, a founder of RetractionWatch, a database that documents dodgy publications. "The kindling is the publish-or-perish culture." If scientists want to fix the problems caused by AI slop, fixing incentives is the place to start. ■

Well Informed

Do you need to walk 10,000 steps a day?

How fast you walk may be as important as how much

"WALKING IS MAN'S best medicine," said Hippocrates, an ancient Greek physician. Or so the story goes. Whether the phrase originated with him is disputed. But it does contain a kernel of truth. Walking is a form of exercise that is free, requires no equipment and is easy for most people to incorporate into their days. But how many steps should one walk—and at what speed—to unlock its benefits?

Conventional wisdom sets 10,000 steps per day as a good target. The source of that number, though, is as questionable as Hippocrates's quotation. Its origins lie not in a clinical trial, but a Japanese advertising campaign for a pedometer launched ahead of the 1964 Tokyo Olympics (10,000, in Japanese Kanji, also looks a little like a person walking). Those committed to getting their steps in should not shy away from the 10,000 mark. But in terms of scientific research, the number barely has a leg to stand on.

A study published in *Lancet Public Health* in 2025 considered 57 papers published since 2014 to assess the connection between different daily step counts and various health outcomes. Walking more was found to be beneficial across the board. Taking 7,000 steps a day, in contrast to 2,000, brought about a 47% lower risk of premature death, a 25%

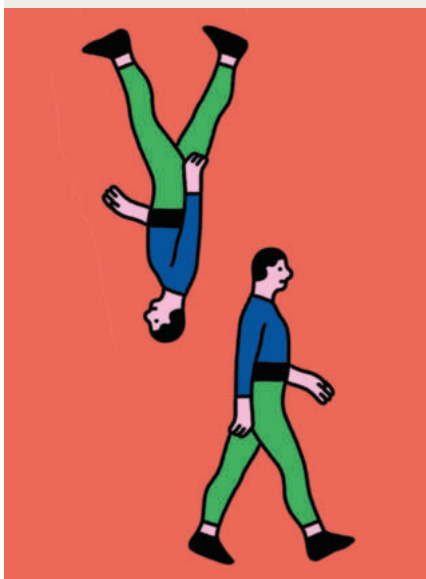
lower chance of developing cardiovascular disease and a 14% reduction in the risk of diabetes. Even a little goes a long way: going from 2,000 daily steps to 4,000 resulted in a 36% drop in mortality risk over the years tracked.

But the benefits eventually taper off. "What we see with most of the health outcomes is a diminishing return on investment after 7,000," says Melody Ding, an epidemiologist at the University of Sydney, who led the study. Extra steps keep helping, but beyond around 7,000 per day, they are scarcely worth the effort. The jump from 7,000 daily steps to 10,000, for example, led to only a 2% further reduction in mortality risk.

Step count is only one measure. Another is intensity, which scientists generally quantify using cadence: the number of steps taken per minute. According to Dr Ding, the evidence for an ideal cadence is harder to pin down. Still, she says, sports science generally suggests that as far as physical activity is concerned, the more intense, the better: "If people can get the heart rate up, or a little bit out of breath," she says, "that would definitely have health benefits."

That aligns with the findings of Emmanuel Stamatakis of Monash University, in Melbourne. Writing in the *British Journal of Sports Medicine* in September, Dr Stamatakis and his colleagues tracked the effects of step count and intensity on the health of 64,743 participants for around eight years, using data from UK Biobank, a large data set. As with step count, quicker cadences were generally beneficial. Those who walked fewer than 5,000 brisk steps per day achieved, on average, a similar reduction in mortality risk to those who walked between 5,000 and 7,500 steps. But diminishing returns applied here, too. The paper suggests the sweet spot, therefore, is 7,500-10,000 daily steps, with frequent bursts at 100 steps a minute.

Any reasonable amount of walking is better than none. But for those unable to walk much, upping the pace might be a way to increase the benefits. "And if you don't have enough opportunities," says Dr Stamatakis, "create them." Rather than parking right outside the supermarket, for example, stop around the block and do a walking sprint in.



Culture



Nostalgia

Party like it's 1999

A tech-powered millennial revival represents the biggest nostalgia boom yet

THE ENTERTAINMENT industry has caught a millennium bug. Arriving in cinemas in November is “Focker-in-Law”, the latest follow-up to “Meet the Parents” (2000), in which Ben Stiller struggled with his girlfriend’s difficult dad. (In the new film Mr Stiller, now 60, plays the father.) No Doubt, whose hits in the 1990s included “Just a Girl”, recently finished a comeback residency at the Sphere in Las Vegas. Meanwhile home audiences can look forward to reboots including “The Inbetweeners”, a popular television series from 2008, and “Tomb Raider”, a classic game of the 1990s that will be re-released in souped-up form in February 2027.

Millennial culture is back, faster than you can say “oat-milk latte”. Millennials, who are now aged 30-45, are nearing the peak of their spending power—and entering management-level jobs where they

can call the shots on new creative projects. The result is that their formative era, the late 1990s and 2000s, is back in fashion. It may seem like only yesterday that millennials were being mercilessly mocked by Gen Z on social media over everything from their grey home interiors to their too-tight trousers. But now they are taking their revenge. “The 2000s called—skinny jeans are back,” declared *Vogue*,

a fashion bible, earlier this year.

Every generation has its revival, as its members grow up and recreate the culture of their youth. The 1990s saw a 1970s resurgence, as middle-aged boomers made nostalgic films such as “The Brady Bunch Movie” and “Dazed and Confused”. Before that there was an outbreak of ’50s nostalgia in the 1970s, with shows like “Happy Days”, “M*A*S*H” and the movie “Grease”. A series of 1950s rock’n’roll revival concerts brought back stars like Chuck Berry and Bill Haley & His Comets, filling venues such as Madison Square Garden.

Yet social and economic changes are combining to quicken and amplify these cultural revivals. The upshot is that the new millennial moment may be the most powerful wave of nostalgia yet, reaching more people than ever before.

One reason is a new creative conservatism, caused by old media’s pinched economics. Cinema-going has fallen sharply since the pandemic (though recently it has become cool again), and social apps are eating into TV viewing. Risk-averse Hollywood executives are therefore falling back on reliable intellectual property. As they run out of superheroes, they are scouring their back catalogues. Earlier this year “The Devil Wears Prada 2” out-grossed the ▶▶

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► 2006 original. In September Sandra Bullock and Nicole Kidman returned after 28 years for a sequel to “Practical Magic”. Next year a “Baywatch” reboot will squeeze new bodies into the red swimsuits that graced TV sets in the 1990s.

The revival is not limited to Hollywood. Indian moviegoers flocked to “Border 2”, the sequel to a hit war film of 1997, after its release in January. Japan’s anime studios have also been cranking out remakes, such as “Hell Teacher” and “Yaiba: Samurai Legend”, aimed at middle-aged millennials who enjoyed the originals in their youth.

Meanwhile, a live-events boom has helped get the music industry into nostalgia mode. Concerts are larger and more lucrative, so retired musicians have greater incentive to get back on the road. Oasis, who provided the soundtrack to older millennials’ teenage years in the 1990s, recently announced a second leg of their comeback tour, which was the second-highest grossing concert tour of 2025. Other millennial-era artists, from My Chemical Romance to Shania Twain, are back on stage. The Dixie Chicks have reformed (now known as just the Chicks—some millennial names have aged better than others).

Social change has further fuelled the millennial boom. The rise of “kidults”, who splurge on toys and fun experiences for themselves, has swollen the market for nostalgic playthings. This year Bandai is celebrating the 30th anniversary of its Tamagotchi, a “digital pet” craze of the 1990s, by re-releasing its original model. In August Lego launched a \$200 “X-Files” set.

Kidult behaviour is perhaps clearest in gaming, where millennials have carried their teenage hobby into middle age. Some 43% of 35- to 44-year-olds in rich countries own a games console, according to GWI, a research company. Sony is courting them with a remake of the “God of War” trilogy, a PlayStation hit from 2005. Nintendo’s remake of “The Legend of Zelda: Ocarina of Time” (1998) will be out in November. Its Switch console can emulate older Nintendo machines, allowing parents to play N64 classics when their children have gone to bed. The rise of millennial executives may also explain a rash of films based on classic games, from last month’s “Resident Evil” to a “Zelda” movie due out next year.

Perhaps the biggest booster of nostalgia, however, is technology that has made older content permanently accessible. On streaming platforms, hit shows never really go away, allowing millennial series such as “Friends” and “Gilmore Girls” to find a new generation of fans. Streaming services like Disney+ and HBO Max use original shows to attract new subscribers, but more than 90% of viewing on their platforms is of older “catalogue” shows, according to Luminate, an analytics firm.

Streaming libraries also make it easy to

hear the sounds of the past. The fastest growth in music streaming is in titles from the 1990s and 2000s, according to Luminate. Among Americans aged 13-24, the share who listen mainly to music from the 2020s fell from 55% in 2021 to 44% in 2025. Millennial stars are selling the rights to their back catalogues while they are hot: Britney Spears, 44, cashed out last year for a reported \$200m. Even new acts often have a millennial sound, from “nu-metal”-inspired bands like Spiritbox and Loathe to pop artists like Addison Rae (who has attributed her “Y2K” style to a youth spent watching stars such as Ms Spears on MTV).

Social media mean that the nostalgia machine is not just stronger: it is also running faster. Whereas boomer-era nostalgia relied on slow-moving channels, like the months-long TV commissioning process, today fashions can be virally rediscovered in an instant. The result is that trends are sometimes getting a second wind within a decade. A popular meme earlier this year declared that “2026 is the new 2016”, with Gen Zs expressing nostalgia for ten-year-old cultural phenomena such as Pokémon Go, a smartphone game.

“Everything goes viral so fast, and it burns so bright,” says one Hollywood agent. “But it burns very quickly.” That means the millennial revival may be the strongest so far—but also that it could be short-lived. Don’t throw away those baggy jeans just yet. ■

Miniatures

In the palm of your hand

Behind the big interest in small things

A CHARMING VICTORIAN home with four bedrooms and two bathrooms has just hit the market for only £1,150 (\$1,500), plus shipping. Newly renovated by the previous owner, this “dream house” promises hardwood floors, marble accents and a “gorgeous wraparound front porch”. The one catch: it is just 54 inches wide by 42 inches tall. At least it has a low heating bill.

Miniatures are having a huge moment. Hobbyists are jumping on the model bandwagon as collectors, makers or both. Attendance at dolls’ house conventions is booming. Miniatures.com, one of America’s leading small-creation retailers, has seen more than a tripling of net sales over the past two years. The International Guild of Miniature Artisans—“miniature” referring to the size of the craft, not to the artisans themselves—saw “a record number” of new people attend their annual art course,



Perfect for a short commute

according to Audrey Tripp, the director.

The resurgence of this whimsical pastime reflects growing enthusiasm for “grandma hobbies”, with people embracing hands-on, analogue activities. The tiny trend offers a “kind of escapism”, says Steve Putnam, a miniaturist and collector. Stuck at home during covid, many young people rediscovered their childhood dolls’ houses, or needed a hobby that did not take up much space. Miniatures provide the freedom to “create anything because it’s so small”, says Mr Putnam.

The ability to control a world appeals during times of instability, too: hence the construction boom in dolls’ houses. “I can’t afford to have this massive dream home, but I’m going to make it from scratch,” says Hannah Lemon, the winner of the second season of “Best in Miniature”, a Canadian reality TV series.

Designing miniatures is no small feat. A recent exhibition at the Museum of the City of New York displayed a replica of the city made from balsa wood, cardboard and glue, which stretched 50 by 27 feet. It took Joe Macken, the artist, 21 years to craft it by hand. Elisabeth Sherman, the curator, says that with the rise of technology “we have a real human desire for things that we can touch, things that we can make ourselves.” The intricate craft forces creators and viewers to slow down.

The final reason for this uptick is technology itself. The rise of 3D printing and laser-cutting has enticed new artisans to the field. Though traditionalists sometimes gripe about these tools, claiming they cut corners (literally) and do not produce high-quality work, most think they have helped craftsmen’s speed and productivity. They have also lowered prices, bringing more people into the thrall of collecting. It’s a small world, after all. ■

A history of espionage

Another spy and traitor

Redwood. By Ben Macintyre. Crown; 416 pages; \$35. Viking; 464 pages; £25

V LADIMIR KUZICHKIN, a KGB spy who defected to Britain after a harrowing escape from Iran in 1981-82, asked for two things: a horoscope and a circumcision. "Recruiting a vetted circumciser had been hard enough," writes Ben Macintyre, a historian, but "locating a security-cleared astrologer was impossible".

"Redwood" is the gripping tale of Kuzichkin's recruitment into MI6. ("Redwood" was his code name.) It is Mr Macintyre's latest true-life spy thriller: earlier narratives have looked at Kim Philby, an MI6 officer who defected to the KGB, among others. It succeeds, like his other books, in melding spies' psychology with an up-close look at the tradecraft of espionage. Each of his protagonists has helped turn the cogs of history at a pivotal moment.

So it went with Kuzichkin (pictured left). A senior officer of the KGB *rezidentura* in revolutionary Tehran, he arrived as the Shah's old order broke down and a new, chaotic regime was taking shape. He was aggrieved by the corruption and barbarity of the KGB and the Soviet regime. But his path to treason was personal, hastened by erectile dysfunction and his failing marriage. He turned to MI6 for help. The service dispatched red pills—vitamin placebos, designed to placate the desperate KGB officer, who later thought circumcision, on

an astrologically favourable date, would solve his medical problem. His recruitment was sealed over gallons of vodka.

Espionage is often a high-stakes game in which hundreds of people and advanced technology might support a single operation. But "Redwood" shows how it can also be amateurish, bumbling and improvised. Ian McCredie, Kuzichkin's MI6 case officer (pictured right), tried to confound Iranian eavesdroppers by blasting Persian radio and running the taps. As Kuzichkin escaped via Turkey, MI6 worried about the prospect of a KGB snatch squad. Their answer was to send an officer armed with a large brass lamp to thump any assailants.

"Redwood" also highlights how spies are not always whom you expect. The KGB was convinced that the flamboyant British ambassador, Nicholas Barrington, was the MI6 head of station in Tehran, rather than the dull Mr McCredie. In fact, Barrington "regarded MI6 in much the same light as the people who cleaned his toilet...and swept the tennis courts". He had no interest in overseeing their work.

Kuzichkin's secrets may have changed the course of Iranian history. America and Britain, worried by the possibility of a Soviet-backed communist coup in Iran, decided to share Kuzichkin's intelligence on communist activities with Iran's regime. Some 4,000-12,000 people were executed in the purges that followed, destroying much of the opposition and consolidating the Islamists' grip on power.

Kuzichkin, "haunted" by their slaughter, died in 2009. MI6 did not co-operate in "Redwood", but Mr McCredie spoke at length to the author. Other living MI6 officers appear under flimsy pseudonyms. Their candour may have caused some discomfort inside the service. But the result is another first-rate spy story. ■

"You Can See Everything"

Mirror, mirror

WASHINGTON, DC

With Elizabeth Holmes, can you ever really see everything?

THERE IS NOTHING more seductive than the idea of unfettered access. When a subject is mysterious, slippery and high-profile, it is even more enticing. The longer a person is in front of a camera, the likelier one is to spot an inconsistency or a lie, or feel resolved they have found out the truth. For truth-telling was surely the goal of Nathan Fielder, a Canadian film-maker and comedian, when he entered Elizabeth Holmes's home for 34 days before she reported to federal prison in Texas in May 2023. She had been sentenced to more than 11 years for fraud and conspiracy related to her blood-testing startup, Theranos.

"You Can See Everything", Mr Fielder's documentary, is an enthralling display of the tension between observer and observed. (It opens in American cinemas on October 16th and in British ones in November.) Mr Fielder and his co-director, Lance Oppenheim, moved in with "Liz"—as well as her partner, Billy Evans, and their two young children—in their oceanfront cottage in San Diego. Subjects who throw open their door would seem to have nothing to hide. But is their openness itself a disguise? The documentary keeps viewers guessing—and riveted.

It is a film of two acts. In the first, viewers witness a brilliant and surreal sequence of intense and often uncomfortable scenes: Ms Holmes insisting that she has not once told a lie in her entire adult life, for example, and Mr Fielder quizzing Mr Evans on whether he has been scammed by Ms Holmes. Time and again Mr Fielder tries to pin his subject down on matters big and small, such as whether Theranos's device really could "perform any test" (she says she was misinterpreted) or whether she understands the joke in a famous comedy routine (apparently not). Often she obfuscates; her replies sound like the "Glomar" response the CIA gives in testimony (neither denying nor confirming the existence of material).

By the time Ms Holmes reports to prison, Mr Fielder remains baffled by her. But is she being careful because she is a liar? Or is she so universally believed to be a liar that she deeply fears making even the smallest error in anything she says? Many film-makers might have ended the project on that ambiguous note. Mr Fielder, instead, ambitiously embarks on an elaborate second adventure, enlisting the help of others who have been sucked into Ms



A partnership written in the stars

► Holmes's orbit, to try to solve the riddle. This makes for spectacular theatre. Mr Fielder apes tactics from Shakespeare, staging a play within a play (within a play).

The film echoes other great works of the "journalist and the murderer" genre. Just as Sarah Koenig of the hit podcast "Serial" struggled with the "bare fact of why on earth would a guilty man agree to let me do this story, unless he was cocky to the point of delusion", Mr Fielder cannot understand why Ms Holmes would let him

so far in unless she truly believed people have the wrong perception of her. Yet intimacy with charming and potentially dishonest subjects breeds a new suspicion: that the journalist or film-maker has been taken in, and that neither subject nor narrator can be trusted.

John Carreyrou, the reporter at the *Wall Street Journal* who helped uncover Ms Holmes's fraud, described in his excellent book, "Bad Blood", how "she emitted a reality distortion field that forced people

to momentarily suspend disbelief." By the conclusion of "You Can See Everything" Mr Fielder appears to believe in at least a little of what Ms Holmes is selling: that she loves her partner and her family, for instance, even though she gave up the last remaining days she would spend with them during their childhoods to make this film. Perhaps believing her makes Mr Fielder a fool. But in the process of potentially being duped, he has also revealed just how brilliant a film-maker he is, too. ■

BACK STORY

Blasts from the past

A new film about Elon Musk will remind you of how much you already know about him

YOU MAY not be a fan of Elon Musk.

Perhaps you're not even very interested in him. But if you watch "Musk", a gruelling new documentary, you will realise that, osmotically, you have come to know a lot about the sometime trillionaire. This is a compliment to his influence and ubiquity. It is less positive news for the documentary itself, even for the whole documentary genre.

In "Musk"—out now in American cinemas and screened at the BFI London Film Festival—Alex Gibney, an Oscar-winning director, sets out to discover how Mr Musk has "assumed so much power, and why had we given it to him?" Using interviews with former colleagues and partners (business and romantic), the first half of the film chronicles Mr Musk's breakneck rise, from PayPal to Tesla's electric vehicles, the satellites of Starlink and reusable rockets of SpaceX.

After a ten-minute interval, the second half covers his plunge into politics and AI. Mr Gibney shows how pandemic rules and the gender transition of one of his many children nudged Mr Musk rightwards. Posing as a "free-speech absolutist", he buys Twitter and tries to run it like Tesla. Then, after Donald Trump installs him at DOGE, he tries to do the same with the federal government. Maybe one day the brain chips that are among his side hustles will let people download this saga in an instant. For now, it lasts almost four hours.

In a parade of talking heads, the missing face is Mr Musk's. He declined to be interviewed and called Mr Gibney a "douche" and "crackpot". The director's solution is to create a somewhat flattering digital avatar which mouths things Mr Musk has said in public. This is fitting, reasons Mr Gibney, since Mr Musk has questioned whether what seems to



be real life is actually a simulation run by future beings. (Popular among pretentious adolescents, the notion that you may only *think* you're here was zapped by René Descartes nearly 400 years ago.)

Viewers may instead conclude that they've been living inside a giant documentary about Elon Musk—since so much of this one feels so familiar. As the deepfake Musk-bot attests, there is an awful lot of him on the record already. Here he is mucking about with a chainsaw and Argentina's president. Here he is in the White House with his young son, X.

What feels fresh? Mr Gibney speculates about the possible abuse of data harvested by Mr Musk's pimply underlings at DOGE. You may be shaken (if not surprised) by reflections from some of his offspring's mothers. "If you were my employee," he reportedly told Justine Musk, his first wife, "I would fire you." After he let her go, one of the women he took up with was Ashley St Clair, a former MAGA influencer, who says: "Elon is a nuke."

The film revisits Mr Musk's unhappy childhood in South Africa, where he was

bullied at school and belittled by his sinister father, Errol, who pops up on camera to rationalise his abrasive parenting style. Observers may wonder how a person as rich and powerful as Mr Musk can be so thin-skinned and needy that he frets over the traction gained by his tweets. The explanation, "Musk" suggests, lies in a kind of arrested development and a yen for affirmation.

Beyond its bloat and paucity of revelations, the problem with "Musk" is that it wavers between two damning—but different—analyses. One is that Mr Musk is an uncompromising fanatic who takes reckless risks in pursuit of his goals, whether autonomous cars or humanity's glorious "multiplanetary" future. On this reading, his story's underlying theme is the cost and virtue of doubt: how a lack of it can fuel stellar success but also be a dangerous flaw.

The other, contradictory critique is that Mr Musk is a grifter, who takes credit for things he didn't do or that may never happen (like colonising Mars). Accordingly, his main talents are self-promotion and securing government contracts and credits; he hitched his rocket to Mr Trump's wagon out of venal self-interest and fear of regulatory trouble. In which case, the lesson is that his acolytes and investors are chumps.

The ultimate moral of this documentary may be less about him than about documentaries. In the over-exposed age of social media and rolling news, it is hard to make a revelatory one on a marquee subject. As for Mr Musk: audiences will blink out of the cinema, wishing his robot project had produced AI usherettes to deliver ice-creams to their seats—and hoping not to hear about him for a while. In that they are, once again, liable to be disappointed.

Government "efficiency"

Axes of Elon

How Donald Trump remade America's government

Blockers. By Michael Lewis. *W.W. Norton & Company*; 256 pages; \$29.99. *Allen Lane*; £25

IT WAS DURING the early months of the pandemic, and Donald Trump was vexed. Experts had told him that hydroxychloroquine, a malaria drug, was no good as a treatment for covid-19. He summoned Francis Collins, the head of the National Institutes of Health, to put him straight. The president had compelling anecdotal evidence. "Get me Jack Nicklaus!" he shouted to a flunkey. Mr Nicklaus was an 80-year-old ex-professional golfer. He had caught covid, taken hydroxychloroquine and recovered, he told Dr Collins. "There, you see!" said Mr Trump. "You see!"

Dr Collins, who discovered the gene for cystic fibrosis, tried to respond tactfully. No disrespect to Mr Nicklaus, arguably the greatest golfer in history, but most people who contract the virus get better. Only a double-blind randomised controlled trial can reveal whether a drug actually works, and such trials had shown that this one did not. Mr Trump never summoned Dr Collins for a private meeting again.

To govern well requires finding accurate information and analysing it rationally. Mr Trump's scorn for such principles has increasingly infected the federal government. During his first term, Dr Collins merely had to endure a nutty lecture from Robert F. Kennedy junior about how vaccines cause autism. In his second term RFK junior is the health secretary, Dr Collins was pushed out and measles is spreading among unvaccinated American kids.

In "Blockers" Michael Lewis tells the stories of federal workers who tried to resist Mr Trump's assault on the bureaucracy. Most are low-key, diligent and startled to be told by Elon Musk and his Department of Government Efficiency (DOGE) that their offices are hotbeds of fraud, waste and wokery.

Mr Lewis is a journalist who spins technical topics into entertaining tales; previous works have taken on Wall Street ("Liar's Poker") and data and baseball ("Moneyball"). He concedes that waste in government is a real problem. Employees are too hard to sack. He tells the story of Maxine, an air-force employee who parked close to a fire hydrant, was asked to move, refused, accidentally reversed into a cop and drove off. The ensuing car chase shut

down an air base during a war. When she was fired, she filed a grievance and won. When she eventually returned to work, she found that two higher-ranking officers were doing her job in addition to their own. When she found out they were paid more than her, she claimed discrimination (she was black) and sued for a pay rise.

Reform was—and is—needed. Unfortunately, Mr Trump's hatchet men did not understand the machine they were trying to re-engineer. They "thought in stereotypes", writes Mr Lewis. The typical DOGE person was a 25-year-old techie "dying to breathe the same air as Elon Musk and only just now grokking the fact that the United States government had three branches". They were mainly "white guys easily bent out of shape by...the idea of people who were not white guys having unfair advantages". They had "a simple picture in their heads of 'the bureaucrat', and that person looked a lot like Maxine".

So DOGE started slashing. It attempted to fire all the probationary staff—the recent hires who were mostly either young or had urgently needed skills. Permanent staff were offered hefty payouts to quit. Many who could easily find other jobs accepted; the less capable ones stayed. A return-to-the-office rule was enforced mindlessly. DOGE killed a study of how wildfires spread into suburbs, because the only computers powerful enough for its

modelling were not in a government office.

DOGE failed to make the state smaller, despite Mr Musk's ambitious promises. But it did make it dumber. Colette Delawalla, a clinical psychologist, was told that her application for a research grant would fail because it contained the word "translate" (which includes "trans") and "bias" (an essential term in statistics that is also used in complaints about racism).

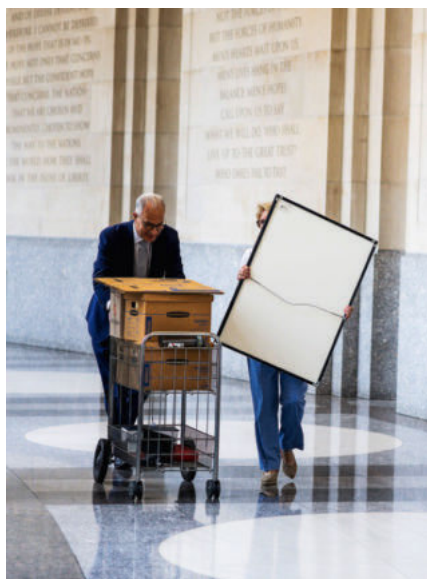
It made it crueller, too. Mr Musk was outraged that the United States Institute of Peace was paying a former member of the Taliban. The man was supplying vital intelligence. After Mr Musk outed him on X, the informant's family was rounded up and tortured. The Trump revolution also made government less accountable, by suppressing evidence that his policies were hurting people. After he cut food subsidies for the poor, a survey measuring hunger was scrapped.

Most disturbing of all, in Mr Lewis's telling, Mr Musk's tech-savvy footsoldiers saw the law as an obstacle to work round, rather than a guide. Mr Lewis tells the story of Kathleen Walters, the chief privacy officer at the Internal Revenue Service (IRS). DOGE had sent an email to every federal employee ordering them, on pain of dismissal, to each list five things they had accomplished in the previous week. Since violating taxpayers' privacy is a crime, many at the IRS risked prison if they responded—and the sack if they didn't.

Ms Walters hooked horns with Gavin Klinger, a young hoodie-clad DOGE staffer. Mr Klinger showed up at the IRS demanding access to all its systems and taxpayer data. This was plainly illegal. Even worse was an effort by a Trump appointee to make the IRS share with the immigration authorities personal data about millions of illegal immigrants who had filed tax returns.

The IRS had spent decades reassuring such people that, if they wanted to pay taxes and build a record of civic virtue that might one day help them win legal status, their privacy would be respected. Mr Trump wanted their addresses so he could shackle and deport them. An acting IRS commissioner, who had been in the job for only an hour, sent out the request on a Friday night, doing an end run around the woman whose job it was to say no.

Alerted by a colleague, Ms Walters called the acting commissioner from outside a pizza restaurant, and warned her that the plan was unlawful. Two months later, after having spent an evening hiding from Mr Klinger in a darkened conference room, Ms Walters quit. Later, in Texas, teams of ICE agents showed up in a Latino neighbourhood knowing exactly which doors to jimmy open. A court ruled that the IRS data-sharing with ICE was illegal, but for many of its victims—and for trust in the system—it was too late. ■



Suited and booted

Economic & financial indicators

	Gross domestic product				Consumer prices			Unemployment rate		Current-account balance		Budget balance		Interest rates		Currency units	
	% change on year ago				% change on year ago			%		% of GDP, 2026 [†]		% of GDP, 2026 [†]		10-yr gov't bonds		per \$	
	latest	Q2	quarter*	2026 [†]	latest	Sep	2026 [†]	4.2	Sep					latest, %	change on year ago, bp	Oct 15th	% change on year ago
United States	2.2	Q2	2.2	2.3	3.7	Sep	3.3	4.2	Sep	-3.5		-6.5		5.2		116	-
China	4.3	Q2	3.6	4.7	0.9	Sep	0.9	5.3	Aug ^{‡§}	4.3		-5.4		1.4	\$§	-16	6.69
Japan	0.9	Q2	1.4	0.8	1.9	Aug	1.8	2.5	Aug	4.0		-1.8		3.0		135	158
Britain	1.4	Q2	2.1	1.3	3.1	Aug	3.3	4.9	Jun ^{††}	-3.4		-5.2		5.4		71	0.76
Canada	1.1	Q2	3.3	0.9	3.0	Aug	2.8	6.5	Sep	-0.3		-2.1		3.9		72	1.42
Euro area	1.2	Q2	2.6	0.9	3.8	Sep	3.0	6.4	Aug	2.3		-3.6		3.4		84	0.90
Austria	0.6	Q2	-0.5 [*]	0.4	3.5	Sep	3.1	6.7	Aug	1.2		-4.1		3.7		83	0.90
Belgium	0.5	Q2	0.1	0.6	4.6	Sep	3.7	5.9	Aug	0.2		-5.2		4.3		114	0.90
France	0.5	Q2	0.1	0.4	3.4	Sep	2.5	8.2	Aug	-0.4		-5.4		4.9		147	0.90
Germany	1.0	Q2	1.3	1.0	3.3	Sep	2.8	4.0	Aug	4.4		-4.2		3.4		84	0.90
Greece	1.8	Q2	1.4	2.0	5.1	Sep	3.8	7.4	Aug	-5.6		0.6		4.4		112	0.90
Italy	1.0	Q2	0.6	0.9	4.1	Sep	2.9	6.2	Aug	0.7		-3.0		4.6		115	0.90
Netherlands	1.6	Q2	2.6	1.6	3.0	Sep	2.8	4.0	Sep	8.1		-3.0		3.6		80	0.90
Spain	2.6	Q2	2.8	2.6	5.0	Sep	3.6	10.0	Aug	2.4		-2.5		4.1		89	0.90
Czech Republic	1.8	Q2	1.1	2.0	2.5	Sep	2.0	3.0	Q2 [‡]	0.1		-2.8		5.3		97	21.8
Denmark	5.8	Q2	3.6	2.7	2.2	Sep	1.9	3.1	Aug	11.3		1.2		3.2		78	6.70
Norway	2.0	Q2	2.7	1.5	3.4	Sep	3.0	4.4	Jul ^{††}	13.0		10.0		4.6		56	9.52
Poland	3.9	Q2	4.1	3.4	4.1	Sep	3.0	5.8	Sep [§]	-2.0		-7.0		6.4		96	3.92
Russia	1.3	Q2	8.3	0.7	6.3	Sep	6.2	2.2	Aug [§]	2.3		-3.2		16.5		138	83.9
Sweden	3.2	Q2	6.4	2.1	1.1	Sep	1.6	8.5	Aug [§]	5.3		-2.3		3.2		59	10.0
Switzerland	2.8	Q2	7.8	1.7	1.0	Sep	0.6	3.1	Sep	8.2		0.2		0.6		39	0.83
Turkey	2.3	Q2	4.6	2.7	29.7	Sep	31.0	7.7	Aug [§]	-2.4		-3.5		32.8		304	49.4
Australia	2.1	Q2	1.7	2.1	4.0	Aug	4.0	4.7	Sep	-3.4		-1.5		5.4		103	1.43
Hong Kong	4.3	Q2	-2.5	4.1	1.7	Aug	1.9	3.8	Aug ^{††}	8.1		-2.6		4.1		119	7.85
India	7.8	Q2	6.8	7.2	5.5	Sep	4.6	4.0	Sep	-1.5		-4.3		7.4		90	95.1
Indonesia	5.3	Q2	4.4	5.3	3.3	Sep	3.4	4.7	Feb [§]	-2.1		-2.9		7.1		111	17,978
Malaysia	6.0	Q2	9.3	5.6	1.9	Aug	1.9	2.9	Aug [§]	3.0		-3.6		3.8		37	4.08
Pakistan	4.8	2026 ^{**}	na	3.0	10.3	Sep	9.0	6.9	2025	-1.1		-4.7		12.8	†††	83	277
Philippines	2.3	Q2	2.4	2.9	7.2	Sep	5.6	6.0	Q3 [§]	-4.6		-6.4		7.9		205	63.0
Singapore	5.4	Q3	4.4	5.7	2.3	Aug	2.1	1.9	Q2	15.8		1.3		2.4		64	1.29
South Korea	3.8	Q2	2.6	3.5	2.9	Sep	2.7	2.0	Aug [§]	13.6		-0.6		4.2		138	1,340
Taiwan	12.9	Q2	5.7	12.0	2.7	Sep	2.0	3.3	Aug	25.2		1.6		2.0		73	32.2
Thailand	1.9	Q2	-0.7	2.1	2.8	Sep	1.9	1.2	Aug [§]	-0.3		-5.5		2.3		82	33.6
Argentina	2.0	Q2	-2.3	1.7	33.4	Sep	32.5	7.9	Q2 [§]	0.1		0.2		na		na	1,513
Brazil	2.0	Q2	1.9	2.0	4.6	Sep	4.4	5.3	Aug ^{§***}	-2.6		-7.3		12.8		-121	5.03
Chile	-0.2	Q2	-0.1	0.4	4.1	Sep	3.8	9.6	Aug ^{§***}	-1.1		-1.8		6.1		50	985
Colombia	3.4	Q2	5.2	2.5	6.3	Sep	6.0	9.4	Aug [§]	-2.0		-7.3		13.0		144	3,198
Mexico	2.1	Q2	5.8	1.3	3.5	Sep	3.8	2.7	Aug	-0.4		-4.0		9.3		51	18.5
Peru	2.6	Q2	-1.0	2.8	4.5	Sep	3.8	4.9	Aug [§]	3.2		-2.1		6.5		52	3.44
Egypt	4.7	Q2	4.0	5.1	14.0	Sep	13.7	5.8	Q2 [§]	-4.2		-5.3		25.6		50	53.1
Israel	7.0	Q2	14.9	4.3	1.5	Aug	1.9	2.8	Aug	1.0		-3.3		4.2		28	3.10
Saudi Arabia	-4.7	Q2	-17.9	-4.8	1.9	Sep	1.9	3.0	Q2	-3.8		-7.2		na		na	3.75
South Africa	0.9	Q2	-1.0	1.1	4.2	Aug	4.1	33.6	Q2 [§]	-0.3		-4.4		8.9		-23	16.6

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	% change on:		
	Index	one	Dec 31st
	Oct 14th	week	2025
United States S&P 500	7,718.9	-1.1	12.8
United States NAS Comp	26,692.9	-3.1	14.8
China Shanghai Comp	3,767.2	-2.0	-5.1
China Shenzhen Comp	2,286.9	-4.9	-9.6
Japan Nikkei 225	67,744.3	-3.3	34.6
Japan Topix	4,096.8	-1.4	20.2
Britain FTSE 100	10,724.9	2.5	8.0
Canada S&P TSX	35,584.5	1.5	12.2
Euro area EURO STOXX 50	6,190.4	0.2	6.9
France CAC 40	7,873.1	1.3	-3.4
Germany DAX*	25,298.6	0.8	3.3
Italy FTSE/MIB	49,753.8	-0.4	10.7
Netherlands AEX	1,137.1	1.7	19.5
Spain IBEX 35	19,230.7	0.6	11.1
Poland WIG	158,710.1	1.3	35.4
Russia RTS, \$ terms	905.7	5.1	-18.3
Switzerland SMI	14,129.9	2.3	6.5
Turkey BIST	12,118.3	nil	7.6
Australia All Ord.	8,869.0	-0.3	-1.7
Hong Kong Hang Seng	24,314.2	0.8	-5.1
India BSE	72,781.9	0.2	-14.6
Indonesia IDX	5,943.0	-3.3	-31.3
Malaysia KLSE	1,627.7	1.0	-3.1

	% change on:		
	Index	one	Dec 31st
	Oct 14th	week	2025
Pakistan KSE	165,417.5	-1.9	-5.0
Singapore STI	5,423.3	-3.3	16.7
South Korea KOSPI	6,008.8	-11.7	42.6
Taiwan TWI	48,625.8	-2.4	67.9
Thailand SET	1,575.9	-0.6	25.1
Argentina MERV	2,835,843.0	0.4	-7.1
Brazil BVSP*	206,506.0	1.1	28.2
Mexico IPC	66,790.4	3.3	3.9
Egypt EGX 30	51,492.8	-3.3	23.1
Israel TA-125	4,025.2	2.4	9.9
Saudi Arabia Tadawul	10,138.8	-3.8	-3.4
South Africa JSE AS	108,515.4	1.3	-6.3
World, dev'd MSCI	4,916.2	-0.8	11.0
Emerging markets MSCI	1,659.0	-3.9	18.1
US corporate bonds, spread over Treasuries			
			Dec 31st
Basis points		latest	2025
Investment grade		93	93
High-yield		354	354
Sources: FactSet; Moscow Exchange; Standard & Poor's Global Fixed Income Research *Total return index			

Commodities

The Economist commodity-price index				% change on	
2020=100					
				Oct 6th	Oct 13th*
Dollar Index				month	year
All items	152.8	151.5	-1.8		11.0
Food	153.5	152.3	-2.4		7.8
Industrials					
All	152.2	150.9	-1.2		13.8
Non-food agriculturals	155.4	156.8	1.4		23.8
Metals	151.4	149.4	-1.9		11.4
Sterling Index					
All items	147.9	147.0	nil		11.4
Euro Index					
All items	155.1	154.7	1.3		15.0
Gold					
\$ per oz	4,156.4	4,169.5	-2.9		1.0
Brent					
\$ per barrel	100.6	105.7	-2.8		69.4
Sources: CME Group; FactSet; LME; NOREXECO; NZ Wool Services; S&P; Thompson Lloyd & Ewart; USDA *Provisional. Note: new series for gold, oil and cotton					
For historical indicators data, visit economist.com/economic-and-financial-indicators					

OBITUARY

Annie Dillard

The nature writer and philosopher died on September 15th, aged 81



SHE COULD never forget the moth. It hatched from a cocoon kept by her teacher in a Mason jar, a huge Polyphemus silk moth with, potentially, velvety brown wings bearing a bright blue eyespot. At the moment of hatching, its wings produced a hardening varnish that would enable them to spread. Then it could fly. But the jar was too small, and the varnish worked too fast. The moth, when released on the street, could only walk. But it struggled gamely on with its useless lumps of wings, heading somewhere. In Annie Dillard's mind, it was still going.

She was the only one to see it as it went. She was often a sole observer, quietly noting. A goldfinch shaking a seeding thistle until the down floated, "blind and sweet", all over the landscape. A mosquito biting a poisonous copperhead. A leaf still curled like a thin, pale flame in its bud on a tulip tree. Frogs leaping like flares through a mesh of blue-green algae, "surfacing to awareness". Another frog on the bank of Tinker Creek, stock still, as a giant water bug slowly liquidised its insides and sipped its life away.

It was Tinker Creek that made her famous. The book she wrote about her thoughts and sightings there, "Pilgrim at Tinker Creek", won her a Pulitzer in 1975, when she was only 28. She was the youngest woman to win one, and the first in the man's world of nature-writing. But fame was the last thing she wanted. All she had needed for years was that damp, broken ground near Roanoke, Virginia, the sycamore log on which she sat, the noisy creek with its silvery shiners swarming in the shallows, and the Osage orange tree from which rose, once, a hundred red-winged blackbirds. When the Pulitzer news came, she was washing spinach. She wouldn't have to do that any more, the pressman said. But she would, and did.

Before too long she fled from the unbearable fussing, decamping with her writer husband to Washington state and the islands off the coast. From her various exile places she produced essays, poetry, philosophy, journalism, two novels and an autobiography. For preference she wrote in very small spaces, usually log cabins, facing away from the view. Inevitably people compared her to Henry David Thoreau, the 19th-century naturalist who had been the subject of her master's thesis, but she didn't agree. Unlike him,

she didn't live in most of her cabins; half of "Tinker Creek" had been written, after hours, in a public library. Her favourite writer was not him, but Primo Levi, because he wrote the truth.

Nor did she think of herself as a nature writer. All she saw and noted was part of an overwhelming question: why, among the prodigal beauties and intricacies of the world, was there so much destruction? Why were there thousands of barbles on the wing of a wild goose that any predator might devour? What was the creator—if there was a creator—thinking? Why was there so much care, then none? She loved to watch hatchings and unfoldings. But the hatchlings were immediate food for something else, and each leaf shrivelled in two seasons. This couldn't all be some cynical show, though she sometimes called it that. Perhaps it was more a case that God could do anything, so he did. Wildly, freely.

And what was she, amid all this? Nothing important. She was not needed in creation. Her life seemed no more than the tunnels made by miner larvae on a leaf, "a faint tracery on the surface of mystery". Yet she contained multitudes. She could see, with her naked eye, through two million light years as far as the Andromeda galaxy. She could explore endlessly, as she did, and reflect on her explorations. Those were not, in the end, about understanding nature. She was more of a theologian.

Religion didn't feature much at all as she was growing up, tomboyish and comfortably middle-class, in Pittsburgh. Books did. They swept her away. From the age of five, she reckoned she read 100 books a year. She wanted to know and remember everything: history, geography, geology, mineralogy, criminology, the names of trees and the names of birds. She read and re-read "The Field Book of Ponds and Streams". As with her sightings in nature, so with the written word. Someone had to read these books.

On the writing of books, though, she had strong opinions, laid out in 1989 in "The Writing Life". That life was far from a state of sedentary inspiration. It was arduous, tough and necessarily cruel. The writer's first line of words was a probe into the unknown, digging a path; once she had arrived in a new, promising place, the path had to be erased. Cut the umbilical cord. Everything written up til then probably had to go, even the favourite passages and the load-bearing walls; even, sometimes, the whole original point of the thing. Ruthlessness was essential; no excess. If a book got stuck, or out of control, it must be visited every day, as if the writer were a lion-tamer with a chair shouting "Simba!" Mastery had to be reasserted, and not just—as she asserted hers—with near-continuous coffee and Vantage cigarettes.

In the middle of "The Writing Life" she recorded a peculiar event: the apparently spontaneous combustion of a typewriter. It was a portable Smith-Corona, so not attached to power. The explosion shook the house, and she raced upstairs to find the device erupting with fire and ash. As she tried to douse the flames, sparks burned holes in her shirt. It might have been a careless cigarette, but she did not say so. In her telling there was just, suddenly, fire.

It was often around. As a child, she wanted to run so fast that she would throw out sparks. At Tinker Creek she saw, at sunset, some divine power "rolling along the mountain ridges like a fireball". At moments of "seeing truly" the grass was wholly fire, and the backyard cedar became a tree of lights. She felt lifted then, resounding "like a beaten bell". Yet only she had noticed those things, as only she had seen the death of the Tinker Creek frog, or the crippled moth staggering on. Only she was meant not to miss that horror and that beauty. That was what she was for. ■

Your Hassle-Free Mayfair Pied-à-Terre

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