



Combating drones

A new dogfight

The technology available to deal with rogue drones is getting better

FOR SOMETHING weighing only a few kilograms and costing less than \$2,000, even for a sophisticated model, a small consumer drone can cause an awful lot of havoc. On January 22nd flights in and out of Newark airport, near New York, were suspended temporarily after reports of a drone being aloft nearby. On January 8th Heathrow, London's biggest airport, also shut briefly because of a drone sighting. And in the busy run-up to Christmas London's second airport, Gatwick, was closed for more than 36 hours after drones were spotted flying near its runway. EasyJet, the biggest operator at Gatwick, said this week that the grounding of flights had cost it £15m (\$19m).

Airport incursions are not the only danger posed by drones. A growing number of close drone encounters are being reported by airline pilots. On December 12th a Boeing 737 belonging to Aeromexico managed to land safely at Tijuana after its nose was badly damaged in a collision with what may have been a drone. Elsewhere, drones

are being used to smuggle goods across borders, drugs into prisons, to attack military bases with explosives and in assassination attempts, like that which took place last August on Nicolás Maduro, the president of Venezuela.

The authorities are increasingly concerned. Christopher Wray, the director of America's Federal Bureau of Investigation, said recently that the threat to his country from attacks by rogue drones "is steadily escalating". There are no easy answers to the problem, although it helps to define the nature of the threat. Irresponsible drone pilots might be kept in check by better education, tough penalties and more manu-

facturers installing features such as "geofencing" in drones' mapping software, to prevent them straying into restricted areas. But terrorists and their like will not take any notice of rules and regulations, and will hack software restrictions or build their own drones from readily available components to try to defeat countermeasures. To combat rogue drones will therefore require better technology.

The most extensive review of counter-drone products, by Arthur Holland Michel, co-director of the Centre for the Study of the Drone at Bard College, New York, and his colleagues, is now a year old, having been published in February 2018. Even then, though, at least 235 such devices and systems were on sale or in active development. The most popular methods of drone detection were radar, locating the radio frequencies used by drones, and watching out for them with cameras. But other approaches, including infrared sensors and acoustic devices that can recognise the sounds produced by a drone's electric motors, were also employed. The most frequently used countermeasure was radio-jamming. Because of a lack of industry standards, the report concluded, there was wide variation in the effectiveness and reliability of the technologies.

Some anti-drone systems are based on military hardware, and may be more suitable for use on a battlefield than in civvy street. Firing missiles, bullets or high-▶▶

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► energy lasers to bring down a drone in the vicinity of a commercial airport is dangerous. Besides the risk of hitting unintended objects, or even people (a rifle bullet can still be travelling at lethal velocity several kilometres from where it was fired), there is also the possibility that a target drone may not be knocked out completely, and may thus spin out of control to crash somewhere that causes serious damage or injury. Nor are small drones easy to hit. One that was flown into Israeli airspace from Syria in 2016 survived two attacks using Patriot missiles, as well as rockets fired from a fighter jet.

Measure for countermeasure

Airport operators also need to be careful about electronic countermeasures, warns Iain Gray, director of aerospace at Cranfield University, in Britain. Signal-jamming can block the link between a drone and its operator, or overwhelm a GPS-based navigation system. But unless such jamming is carried out carefully it might also damage an airport's sensitive radio and navigation equipment, and the instruments on aircraft, says Dr Gray. If every plane at an airport had to be checked to ensure it was safe to fly after electronic countermeasures were deployed, that would cause extensive delays in resuming operations.

Anti-drone technology is, nevertheless, improving. This week Indra, a big Spanish technology company, said it had completed extensive testing in "dangerous" places of an anti-drone system called ARMS. Once the system's sensitive radar has picked up a drone, ARMS uses infrared cameras to confirm and identify the type of drone. Electronic-warfare sensors then sweep the radio spectrum to determine what signals the drone is using. This permits ARMS to attempt a "soft kill"—a carefully targeted form of jamming. Indra claims that the system is precise enough to disable either a single drone or a swarm of them, by modulating the level of response, without affecting other electronic equipment on an airfield. Like other approaches, it can also use various "spoofing" techniques, which involve generating bogus signals that can be used to try to seize control of a drone.

Such counter-drone systems can be made portable, permitting them to be used at special events. And they will become increasingly sophisticated. QinetiQ, a British defence firm that makes a counter-drone system called Obsidian, has found ways to use signals to disrupt the electronic circuits within a drone, allowing it to disable a drone's camera or turn off its electric motors. Obsidian can also analyse a drone's flight characteristics and the loading of its electric motors. That helps determine how heavily laden it is, and thus whether it might be carrying explosives.

Both Indra and QinetiQ use an advanced

form of radar that operates in three dimensions. Such 3D radars will be particularly valuable at airports, says Dr Gray. Existing airport radars are bad at picking up small things like drones. Even if they do spot them, they struggle to distinguish them from birds. Conventional 2D radar scans an area using a narrow rotating beam and detects objects when the signal is bounced back, providing range and direction. Height can be determined by a second radar. A 3D radar combines all three measurements, sometimes by using a fixed array that floods an area continuously with a signal. The returning signals are processed to create a three-dimensional model of the entire airspace surrounding an airport.

Another firm making an anti-drone system that uses 3D radar is Aveillant, based in Cambridge, Britain. Aveillant says Gamekeeper, as it dubs its equipment, can detect and classify a small drone up to 5km away. As drones can be difficult to spot by eye, even when they are only a few hundred metres away, 3D radars of this sort would allow airports to detect drone incursions more quickly and be more confident about when it is safe to resume flights.

There are plenty of other ideas for dealing with drones. These include launching defence drones to capture villainous craft by entrapping them in a net; hand-held bazooka-like guns that fire nets propelled by a blast of compressed air; and portable radio-jamming equipment, similarly shoulder-mounted and hand-aimed. In the Netherlands, the police have even tried using trained eagles to attack and bring down small drones, although the idea was eventually dropped. All these methods, though, share a flaw. They usually require operators to be at hand and fairly close to an intruding drone.

That is also true of what might seem the most obvious and simplest way to deal with a drone: a shotgun. Some folk nevertheless think this could be worth a go. Snake River Shooting Products, a firm in Idaho, sells cartridges it says are specially designed to knock a small drone out of the sky. But as the firm scrupulously reminds its customers, they need to use their common sense and obey all laws. One of which is that in America a drone is considered to be an aircraft, and people are not, as a rule, supposed to shoot at aircraft. ■

Marine biology

Cool cucumbers

An apparently sedentary sea creature proves anything but

SEA CUCUMBERS, soft-bodied relatives of sea urchins and starfish, are a sought-after foodstuff. In China alone the market for their flesh is worth \$3bn a year. Unfortunately for those who try to make a living catching them, their populations often seem to undergo a cycle of boom and bust.

Annie Mercier of the Memorial Univer-

sity of Newfoundland, in Canada, was curious to know why this is. In particular, she wondered whether over-harvesting was to blame, or if the animals were simply migrating away. As she reports in the *Journal of Animal Ecology*, they not only migrate, they do so by adopting a second vegetable-like guise—that of tumbleweeds.

The idea of adult sea cucumbers migrating sounds at first implausible. The animals' larvae do indeed range far and wide. But once those larvae have settled they metamorphose into squishy cylinders resembling their vegetable namesakes. These grow, in most species, to a length of between 10 and 30 centimetres. Adult sea cucumbers can, as do starfish and sea urchins, move around using suckerlike structures called tube feet. But they rarely travel any great distance.

Dr Mercier and her colleagues studied two species. One, *Cucumaria frondosa*, lives wild off the coasts of Newfoundland and Nova Scotia. The other, *Holothuria scabra*, was being farmed in enclosures with an area of 15,000 square metres, located off the coast of Madagascar.

To monitor the Canadian animals the ►►



Cucumaria frondosa and friends

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► team used ships equipped with tethered underwater cameras. These filmed at depths of between 220 and 300 metres in Nova Scotia, and 41-57 metres in Newfoundland, for 20 to 30 minutes at a time while the ships were slowly drifting over the surface. The Madagascan animals were easier to observe, given that even at high tide they were only 1½-2½ metres below the surface. In their case the researchers monitored them every 15 days over the course of a year and a half.

Two of the Canadian observations, one at each site, hit pay dirt. Near Newfoundland, a camera captured hundreds of the creatures drifting past in mid-ocean, in a current that was moving at 30 metres a minute. Near Nova Scotia several dozen darted by at speeds averaging 55 metres a minute—fast enough to travel 80km in a day. Madagascar provided no direct evidence of this sort of movement. It did, however, indicate how it may start. The team found that during ebb tides when the moon was full (and the tide thus at its springiest) farmed individuals of *Holothuria scabra* sucked in water and became buoyant enough to roll outside the fenced enclosures. Since an ebbing spring tide is the moment the current is most likely to carry an object out to sea, this behaviour looked like some sort of escape strategy.

These discoveries suggested that adult sea cucumbers, far from being sedentary, do indeed use ocean currents to move about. To find out more, Dr Mercier welcomed members of *Cucumaria frondosa* into her laboratory for testing. She speculated that exposing them to crowded conditions might lead them to engage in migratory behaviours. And so it proved.

The Great Escape

Dr Mercier and her team put the animals into tanks at four population densities, varying from solitary confinement to 5, 10 or 15 a square metre. The higher the density the fewer the tube feet an animal kept in contact with its substrate—and the more easily it was carried away by any current. This reaction was even more extreme when other stresses, such as high turbidity or low salinity, were added. These encouraged the animals to detach their tube feet completely, open their cloacas to flood their bodies with water, and thereby transform themselves into buoyant rounded blobs, readily carried away by the slightest movement of the water.

In light of all this Dr Mercier suggests the boom-and-bust nature of sea-cucumber fisheries, though not caused by actual overfishing, might nevertheless be a migratory response to disturbance created by trawling. If this proves to be so, then those seeking to make a living selling sea cucumbers may wish to find gentler ways of harvesting them. ■



Palaeontology

Like clockwork

Shifts in Earth's orbit may increase the chances of spectacular fossils

FOR PALAEOLOGISTS, fossils are buried treasure, and, like treasure of the more conventional sort, such finds are not all of equal value. Fossilised bones, while useful, are reasonably common. Preserved impressions in fine sediment of soft parts like skin and organs are rarer and concomitantly more helpful when it comes to understanding what ancient life was like. But the palaeontological equivalent of finding royal jewels is the discovery of soft tissues that have themselves become preserved. Until now it has been assumed that soft-tissue preservation is a chance, and therefore unpredictable, event. But work published in *Geology* by Farid Saleh of Claude Bernard University in Lyon, France, suggests that regular variations in Earth's orbit can affect the preservation of soft tissue in predictable ways.

For such tissue to be preserved, minerals that impede the activities of tissue-consuming bacteria need to surround the body of a dead organism quickly, before it can rot away. Iron-rich minerals are particularly good at keeping flesh-eating bacteria at bay and are thus commonly found in the sediments around soft-tissue fossils. These sorts of minerals appear in the geological record seemingly at random but, while studying the Fezouata shale, a 500m-year-old formation in Morocco, Mr Saleh noted that exquisitely preserved soft-tissue fossils of annelid worms, sponges, arthropods

(pictured) and echinoderms seemed to turn up at regular intervals.

Intrigued by this, he assembled a team to take a closer look and found that, while fossils of the hard parts of animals (shells, sponge spicules and so on) were common in all sedimentary layers, soft-tissue fossils were confined to six layers deposited at intervals of 100,000 years, or multiples thereof. These particular fossils had all formed through a process called pyritisation whereby pyrite, a substance also known as fool's gold, and composed of iron sulphide, seeped into the tissues of the dead animals and mineralised them.

The team then analysed rock from other strata in the formation and found it to be poor in iron—with three telling exceptions. These were places that the 100,000-year cycle suggested should be pyritised, but were not. They were, however, iron-rich, suggesting the cycle is real. That pyrite seemed not to have formed in them was because the conditions of their birth were oxygen-rich. Pyrite forms only in the absence of oxygen. And, for the preservation of soft tissue, it is insufficient that iron be present. It must also invade that tissue and precipitate within it, which pyrite is particularly good at doing.

These findings presented Mr Saleh with the question of why iron flooded into the shallow sea where the Fezouata shales were forming only every 100,000 years, and this led him to ponder planetary movements. Earth revolves around the sun in an orbit that is almost, but not quite, circular. Its actual shape is an ellipse, and the elongation of this ellipse, a property called its eccentricity, oscillates over the course of time. That, in turn, affects the extremity of the seasons Earth experiences. The more eccentric the orbit, the more extreme the difference between summer and winter.

Such seasonal variation can show up in all sorts of ways. And, when Dr Saleh compared the pattern of this oscillation, which is well-established back beyond 500m years ago, with that of his 100,000-year spikes of iron availability, he found that the spikes coincided with moments of maximum eccentricity. He reasoned that the more intense seasonality was causing greater rainfall, increased erosion and, consequently, the transport of more iron from land to sea. These ferrous pulses, in turn, preserved the soft tissues of dead animals, so long as the sediments at the bottom of the sea were anoxic at the time.

Whether Mr Saleh has come across something that is merely a local fluke or is a phenomenon that has parallels elsewhere—and which might thus be used to hunt for previously unknown rocks with good soft-tissue preservation—remains to be seen. At the least, though, he has shown how astronomical events can have unexpected consequences on Earth. ■

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Modern life

A pressing problem

The pros and cons of placebo buttons

SUPPRESSIO VERI, suggestio falsi. Over the course of many years, without making any great fuss about it, the authorities in New York disabled most of the control buttons that once operated pedestrian-crossing lights in the city. Computerised timers, they had decided, almost always worked better. By 2004, fewer than 750 of 3,250 such buttons remained functional. The city government did not, however, take the disabled buttons away—beckoning countless fingers to futile pressing.

Initially, the buttons survived because of the cost of removing them. But it turned out that even inoperative buttons serve a purpose. Pedestrians who press a button are less likely to cross before the green man appears, says Tal Oron-Gilad of Ben-Gurion University of the Negev, in Israel. Having studied behaviour at crossings, she notes that people more readily obey a system which purports to heed their input.

Inoperative buttons produce placebo effects of this sort (the word placebo is Latin for “I shall be pleasing”) because people like an impression of control over systems they are using, says Eytan Adar, an expert on human-computer interaction at the University of Michigan, Ann Arbor. Dr Adar notes that his students commonly design software with a clickable “save” button that has no role other than to reassure those users who are unaware that their keystrokes are saved automatically anyway. Think of it, he says, as a touch of benevolent deception to counter the inherent coldness of the machine world.

That is one view. But, at road crossings at least, placebo buttons may also have a darker side. Ralf Risser, head of FACTUM, a Viennese institute that studies psychological factors in traffic systems, reckons that pedestrians’ awareness of their existence, and consequent resentment at the deception, now outweighs the benefits.

Something which happened in Lebanon supports that view. Crossing buttons introduced in Beirut between 2005 and 2009 proved a flop. Pedestrians wanted them to summon a “walk” signal immediately, rather than at the next appropriate phase in the traffic-light cycle, as is normal. The authorities therefore disabled them, putting walk signals on a preset schedule instead. Word spread that button-pressing had become pointless. The consequent frustration increased the amount of jaywalking, says Zaher Massaad, formerly a senior traf-

fic engineer for the Lebanese government.

Beirut’s disabled buttons are, says Mr Massaad, now being removed. They should all be gone within three years. New York has similarly stripped crossings of non-functioning buttons, says Josh Benson, the city’s deputy commissioner for traffic operations, though it does retain about 100 working ones. These are in places where pedestrians are sufficiently rare that stopping the traffic automatically is unjustified. However, internet chatter about placebo buttons has become so common that doubt, albeit misguided, seems to be growing about even these functioning buttons’ functionality. This suspicion, says Mr Ben-

son, has spread beyond New York, to include places such as Los Angeles, where almost all the crossing buttons have always worked, at least during off-peak hours.

Truth be told, though, the end may be nigh for all road-crossing buttons, placebo or real. At an increasing number of junctions, those waiting to cross can be detected, and even counted, using cameras or infrared and microwave detectors. Dynniq, a Dutch firm, recently equipped an intersection in Tilburg with a system that recognises special apps on the smartphones of the elderly or disabled, and provides those people with 5 to 12 extra seconds to cross. That really will be pleasing. ■

Trick photography

Out of the shadows

A simple camera that can see round corners

CAMERAS THAT look round corners already exist. But they rely on specialised lasers which blink on and off trillions of times a second, and light detectors sensitive enough to track individual photons. Something simpler and more robust would be desirable. And, as they describe in *Nature*, a team at Boston University in Massachusetts, led by Vivek Goyal, think they have the makings of one.

In their prototype, Dr Goyal and his colleagues placed an opaque object called an occluder in front of a TV screen that was hidden around the corner from a digital camera (see diagram). Illuminated by the screen, the occluder cast a partial shadow, known as a penumbra, on a wall that the camera could see. Run through appropriate algorithms, pat-

terns within the penumbra, invisible to the eye but recorded by the camera, could be used to reconstruct cartoon faces, university logos and arrangements of stripes that the screen had displayed.

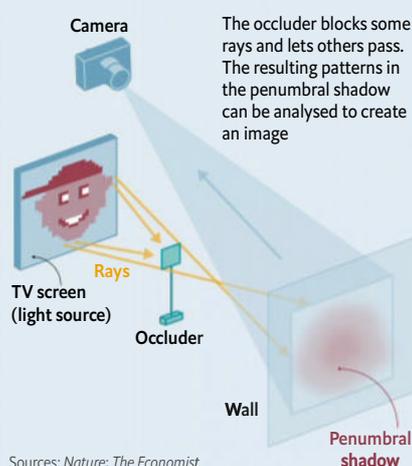
The crucial part of the system was the occluder. Because its shadow was only partial, the wall reflected some light from the screen, but not all of it. In this case the old saying that absence of evidence is not evidence of absence is incorrect. If the size and shape of the occluder are known, it is possible, using sufficiently dizzying maths, to calculate from the pattern of the penumbra what light has been blocked—and thus what the image on the screen looked like.

Having to know the size and shape of the occluder is, admittedly, quite a restriction on the implementation of Dr Goyal’s method. But these are early days. Future algorithms could include more unknowns about the occluder. That would slow things down computationally (and the prototype is not, in any case, that rapid; it takes 48 seconds to produce an image from the data). But, as computers get faster, this problem should eventually be surmounted.

If it can be surmounted to the point where occluders of arbitrary shape, such as rocks, trees or parked vehicles, can be used, and the definition of a “wall” is similarly flexible, then round-the-corner imaging of the sort Dr Goyal describes might find wide application. Soldiers would love it, to help avoid nasty, hidden surprises. And self-driving cars that could see down side streets would be much safer. At that point a second old saw would have been proved wrong. Out of sight would no longer necessarily be out of mind.

Me and my shadow

How to take a picture round a corner



Sources: *Nature*; *The Economist*



Political theory

The wheel of history

A century after he formulated them, Max Weber's ideas about the challenges of democratic politics are still illuminating

IN JANUARY 1919 Munich was in turmoil. Revolution in November of the previous year had swept away the King of Bavaria, installing a ramshackle regime headed by a messianic journalist of the radical left, Kurt Eisner. As in much of Germany in the aftermath of the first world war, rival factions of left and right battled for power on the streets. In Berlin the communist luminaries Karl Liebknecht and Rosa Luxemburg were murdered as Social Democrat party leaders used Freikorps paramilitaries to assert the authority of their fledgling government. Eisner himself would soon be shot dead by a reactionary nationalist.

The Weimar Republic was being born, as it would die, in blood. On January 28th, in this febrile atmosphere, Max Weber made one of the most important contributions to modern political theory, in a lecture titled "Politics as a Vocation" ("Politik als Beruf"). Eerily relevant in today's age of demagoguery, it is as valuable a map to the contemporary political landscape as it was, 100 years ago, to Weber's.

A towering figure of 20th-century German intellectual life—and a founder of the modern discipline of sociology—Weber gave his talk to an association of liberal-

leaning students on the theme of political leadership and political life. Politics, he told them, is a distinct form of activity, with its own brute imperatives. It "means slow, strong drilling through hard boards", a ceaseless struggle between leaders and party elites. Anyone who gets involved makes a pact with "diabolical powers"; there is no moral authority to guide them, and no option but to get their hands dirty, sometimes even bloody. Famously Weber defined the state as the body that claims a monopoly on the legitimate use of force. His audience could expect no comfort from this unyielding reality. Ahead lay "a polar night of icy darkness and hardness".

The trouble with saints

Weber's stern realism was not merely academic. He was contemptuous of Eisner, whom he numbered among the "literati", and considered an exemplar of the type of leader guided solely by a determination to stay true to his principles, whatever the consequences. This "ethic of conviction", Weber argued, was the hallmark of saints, pacifists and purist revolutionaries who could blame the world, the stupidity of others or God himself for the impact of their

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deeds, as long as they had done the right thing. He contrasted that with an "ethic of responsibility", which demanded that politicians own the results of their actions, making moral compromises to achieve those results if necessary. Evil things can flow from good deeds, Weber knew, just as much as the other way round.

For Weber, the true political leader—one for whom politics is a vocation—is characterised by three qualities: passion, a feeling of responsibility and a sense of proportion. The leader has a cause; he or she is not a "parvenu-like braggart with power", whose baseless policies lead nowhere. On the contrary, those marked out for political leadership have ethical backbones and an inner sense of purpose. But these are combined with sober judgment and a deep sense of responsibility. Together these qualities produce politicians who can place their "hand on the wheel of history". It is "genuinely human and profoundly moving" when (like Martin Luther) such leaders say: "Here I stand, I can do no other." Modern readers may wistfully agree.

Weber was a liberal nationalist who believed that the fate of Germany was the central *raison d'être* of politics. His preoccupation with the character and ethics of politicians reflected his belief that his country faced a moment of great peril and needed strong, capable leadership of the kind he celebrated in his Munich lecture. Germany had been badly led in the war and was threatened with subjugation by its victors. Weber was not above calling on his students to resist occupation by force; he gave succour to irredentist sentiments. But ▶▶

▶ he was chiefly interested in how Germany could produce statesmen able to guide it out of the turmoil of defeat and civil conflict. It might have lost its place as a world power, but it still had its honour.

Appeals to the power of tradition would no longer work, however. The Kaiser had abdicated and the monarchy was gone. A modern nation following the democratic path, Weber argued, had two options: rule by bureaucrats and parliamentary cliques acting from self-interest and “living from” politics; or a “leadership democracy” in which a charismatic leader, “living for” politics, commands a party machine that can mobilise voters. Mass democracy, Weber knew, always meant rule by elites. But voters had a choice between responsible and irresponsible kinds. He admired William Gladstone’s ability to dominate both Parliament and the Liberal Party; but for Germany he advocated a directly elected president who would stand above the petty factions of parliamentary politics and the fiefs of the federal territories.

This was to become one of the most contentious of Weber’s legacies to German politics. He was active in public debates about the Weimar constitution and was recruited to an official commission given the task of framing it. His support for a “Caesarist” president, or “plebiscitary dictator of the masses”, would later draw criticism that it prefigured the overthrow of the Weimar Republic by the Nazis, despite the fact that Weber’s proposals mixed parliamentary and directly elected elements, and remained liberal, not authoritarian.

The iron cage

Weber died of Spanish flu in 1920, but “Politics as a Vocation”, and the newspaper articles he wrote at the same time, remained touchstones for German debates on democracy and constitutional law for the rest of the 20th century. In Anglo-American thought, his talk became a classic of political theory after it was translated into English and published in America after the second world war. It has commonly been read as a lecture in two parts: one a scientific study of modern parties and leaders, the other a meditation on the ethics of political leadership. It has been hugely influential in the realist tradition of political theory, which emphasises the role of states and interests over values and has experienced a revival in recent years.

A century on, Weber’s insights still help make sense of politics. In democracies governed by elites who struggle with each other for power, while paying lip service to equality or liberty—and who sometimes deploy violent means to pursue their goals—his arguments remain grimly compelling. His cool appraisal of demagoguery is useful for understanding the rise of charismatic authoritarians who command obe-

dient party machines. The antics of Vladimir Putin, Viktor Orban or Recep Tayyip Erdogan would not have surprised him.

Nor would the recent fall from grace of “responsible” leaders of the centre ground, for whom pragmatism and technocratic management have proved unequal to the demands of a turbulent age. Weber, after all, insisted on the centrality of passion and the struggle for power in politics. Donald Trump, meanwhile, is a brittle composite of Weberian types—not obviously possessed of an ethic of conviction, but sustained in power by a Republican Party machine and his own peculiar charisma. He would doubtless have repulsed and fascinated Weber in equal measure.

“Politics as a Vocation” continues to inspire those who want to understand poli-

tics as it is, not as they might wish it to be. Yet realism like Weber’s can also seem like acquiescence in the status quo. His left-wing critics believed he was trapped in an iron cage of his own making, unable to see how the tides of history might open up possibilities of radical change.

One of the students who attended his lectures in Munich in 1919 was Max Horkheimer, a founder of the Frankfurt School of critical theory. Many years later he would remark of a Weber lecture: “Everything was so precise, so scientifically austere, so value-free, that we went home completely gloomy.” That charge has echoed down the years, and points to a dilemma that still faces all practitioners of democratic politics: can you be realistic and radical at the same time? ■

The elite that failed

The Davos delusion

Down with philanthrocapitalism, says an entertaining polemic

IT IS MORE than 20 years since Samuel Huntington introduced the concept of Davos Man in his great book “The Clash of Civilisations”. Now Anand Giridharadas has gone one better and taken his reader deep inside the mind of that peculiar creature. Everybody knows the basics: Davos Man believes that markets are more efficient than governments and that globalism is preferable to nationalism or localism. Mr Giridharadas’s trick is to focus on the more intriguing parts of the Davos world-view: that businesses can “do well by doing good”; that philanthropy needs to be “reinvented” for the age of the internet and the T-shirt-wearing billionaire; and that one of the greatest problems facing the world, even as some inner-cities are ravaged by



Cruel to be kind

Winners Take All: The Elite Charade of Changing the World. By Anand Giridharadas. *Knopf*; 304 pages; \$26.95. *Allen Lane*; £12.99

drugs and violence, is that there aren’t enough Davos Women to join the Davos Men in this win-win nirvana.

A few years ago Mr Giridharadas, who works as a political analyst for MSNBC and teaches journalism at New York University, stumbled across a big problem—that the rise of the win-win mantra had coincided with one of the longest periods of wage stagnation in American history. Davos Man’s smiley-faced faith in business-led solutions (green bonds, impact investing, social innovation and the rest) concealed a harsher reality. Businesses were relentlessly pursuing efficiency and cutting costs—shifting jobs to cheaper places or forcing people to work longer hours—and then recycling a fraction of the profits they made into Davos-style consolations.

All this recycling is wonderful for the billionaires who derive a warm feeling from spending their money on helping the poor. It is wonderful for CEOs who can burnish their brands by embracing the latest fashionable good cause. It is particularly wonderful for the “thought-leaders” who can spend their lives hanging out with Sergei and Mark and suggesting clever ways for their philanthrocapitalist masters to cure the world’s ills. But it does little to make up for the winner-takes-all philosophy that is driving companies to hold down wages and transfer the burden of risk onto ▶▶

► their employees. And it does little to solve the problems of “the unexotic underclass”—white ex-working-class men in particular—who have been deemed too boring and reactionary for the Davos crowd to bother about.

It is easy to raise objections to Mr Giridharadas’s argument. He ignores the fact that figures like Bill Gates have done a great deal of good. He doesn’t mention that, even though incomes in the West have stagnated in recent decades, hundreds of millions of people in the emerging world have been lifted out of poverty. His anti-business animus is blunt-edged: he would have been better off focusing on genuine scandals such as tax-dodging rather than railing against efficiency-seeking in general. Yet in some ways these objections miss the point. “Winners Take All” is a splendid polemic that is all the better for simplifying and exaggerating.

Mr Giridharadas writes brilliantly on the parasitic philanthropy industry that somehow manages to hold its meetings in desirable resorts (Davos in the ski season, Bellagio in the summer) rather than in Detroit or Lagos. In one particularly stomach-turning section he reports on a luxury cruise, Summit at Sea, where various big-wigs discuss ways to improve the world while sitting in the well of the Bliss Ultra Lounge. “The boat’s not about getting drunk and getting naked,” a motivational speaker intones. “Well, it’s sort of about that. But it’s also about social justice.”

He produces worrying case studies that illustrate his theme of companies creating big social problems and then offering sticking-plaster solutions in the form of philanthropy. For example, Purdue Pharma has an impressive record of providing grants that “encourage the healthy development of youth by reducing high-risk behaviours such as substance abuse”. But one reason that the company can afford such largesse is that it has made a fortune from marketing OxyContin, a drug that, thanks to over-prescription, is at the heart of America’s opioid epidemic.

The only genuine failure of this otherwise excellent screed is that Mr Giridharadas does not push his argument further. He rightly goes beyond inequality of wealth to address inequality of power: how win-win fixes invariably take problems out of the political realm and sub-contract them to unaccountable global elites. But he says nothing about the fascinating issue of inequality of esteem.

The Davos elite is not content with hoarding an inflated proportion of the world’s wealth and power. It is trying to appropriate an outside share of the world’s esteem by reinventing philanthropy in its own techy and globe-trotting image. It is not just Davos Man’s vices that are fuelling the populist fire. It is his virtues too. ■



Native American history

Still beating

The Heartbeat of Wounded Knee. By David Treuer. Riverhead Books; 512 pages; \$28. To be published in Britain by Corsair in March; £25

ACCORDING TO A convenient myth dating back to the 19th century, Native Americans were doomed to vanish, except for a few hold-outs on remote and poverty-stricken reservations. A corrective is urgently required, argues David Treuer, an anthropologist, novelist and member of the Ojibwe people, in his new survey of “Indian country” since the massacre at Wounded Knee in 1890.

That attack on Lakota Sioux by the 7th Cavalry killed at least 150 people and marked the last major armed conflict between Indian tribes and the federal government. For many Americans, it also came to signify the end of Native culture itself, due in part to a hugely influential book, “Bury My Heart at Wounded Knee”. Published in 1970, the book held that by 1890 “the culture and civilisation of the American Indian was destroyed”. After growing up on the Leech Lake Reservation in Minnesota, Mr Treuer found this view not just wrong, but soul-crushing. His sweeping, essential history is “not about the heart that was buried in the cold ground of South Dakota, but rather about the heart that beats on.”

Like its predecessor, his account opens with a catalogue of murder, disease and displacement. His survey of Indian homelands and their destruction is dry but necessary, since many Americans of European descent are unacquainted with the facts

(some seem to regard the country as their patrimony alone). But it is in recounting more recent history that Mr Treuer’s storytelling skills shine. He salts a century’s worth of wrangling over the rights guaranteed by 19th-century treaties with personal stories from numerous tribes.

A host of paternalistic programmes meant to solve the “Indian problem” mainly backfired, he shows. These included forced assimilation through boarding schools, which aimed to “kill the Indian” to “save the man”, the destruction of collective land-ownership on reservations through individual allotments (in which wealthy whites, more often than not, snapped up the best plots), and later manoeuvres that ended the legal status of some tribes.

Yet the schools, as well as military service in both world wars, had an inadvertent benefit: to forge a pan-Indian identity. Like other marginalised groups, Indians moved to the cities and began to organise. From 1970, through the activism of the American Indian Movement and legal training that helped define—and defend—their rights, tribes started to rebound. Indian culture experienced a rebirth.

Mr Treuer’s elegant handling of this complex narrative occasionally falters. For example, he omits to set out clearly how tribal sovereignty works. Only midway through do readers learn that federal funding for such things as Indian health and education “are not pity payments or proto-welfare”, but commitments established by treaty in exchange for the loss of 97% of ancestral lands. That provenance refutes the frequent and mistaken assumption that most Native Americans are on the dole.

But his writing sings when he celebrates recent gains. By 1900 a Native population estimated to have numbered 5m when Christopher Columbus arrived had dropped to 237,000; the census of 2010 counted 2m, plus 3m identifying as partly Native. Casinos are giving some of America’s more than 500 tribes an economic boost. These days, enterprising Native Americans “actively remember and promote indigenous knowledge”; Mr Treuer introduces several, including a Sioux master chef and young women who extol healthy ways of life as a form of “warrior strength”. He ends with the Standing Rock pipeline protest of 2016 (pictured), the largest gathering of Native Americans since the battle of the Little Bighorn in 1876, which catapulted their struggle into national headlines for the first time in decades.

How Americans imagine their future depends on how they see their past, Mr Treuer argues. In a year in which, for the first time, two Native American women have taken seats in Congress, it is possible to infer that his community has not only survived, but begun to thrive again. ■

New American fiction

Above us only sky

The Dakota Winters. By Tom Barbash. Ecco; 336 pages; \$26.99. Scribner; £14.99

ANTON WINTER leads a charmed life. As a rich and restless 23-year-old in New York in 1980, he drinks martinis at the Plaza, takes meetings at the Algonquin and snorts coke in club bathrooms. He lives in the Dakota, Manhattan's most coveted address, where Roberta Flack and Leonard Bernstein rub shoulders in the lift. And he has a job his peers would kill for, producing a talk show on which celebrities wisecrack and bare their souls. The only problem is that he owes everything to his famous father, Buddy Winter, the show's star.

"The Dakota Winters", Tom Barbash's new novel, is about fathers and sons, the perniciousness of fame and the challenge of second acts. It is also about the grit and glamour of the city at a time when rents were affordable and muggings rife. Much of the drama involves Anton's ambivalent role in Buddy's return to the airwaves after a two-year hiatus. His previous show ended abruptly when he asked, mid-broadcast, "What the fuck am I doing here?" Buddy walked off the set, had a nervous breakdown and travelled the world; now he feels ready to go back on camera—but only with his son's help.

Meanwhile Anton develops a friendship with none other than John Lennon, a fellow Dakota resident, who seems to see him for the man he wants to be, not merely as a facilitator of his father's charms. The fact that Lennon's own comeback will be cut short by his imminent death (at the Dakota's entrance) steeps the story in dramatic irony.

This book goes down like a quaffable wine—easy and engaging, if not terribly complex. Mr Barbash has a habit of spoon-feeding his themes with somewhat unlikely dialogue, such as when Anton's sister warns him that "it's [Buddy's] life story you're writing, and pretty soon you've got to begin writing your own". Those who recall spending their early 20s as self-conscious buffoons may tire of Anton's relentless winning—at work, romantically and so on. It is not for nothing that the most beloved protagonists tend to be outsiders and losers, or bigshots who fall from grace.

Still, Mr Barbash recreates an inviting world. And he observes clearly the insidious human tendency to turn people into idols, only to topple them. "They don't want to even bloody listen to us," Lennon says in the novel. "They want our souls." ■

Urban photography

A schoolroom in the Village

NEW YORK

For 60 years, Alex Harsley has chronicled city life

AT THE 4TH Street Photo Gallery on the corner of the Bowery, silver-gelatin prints are strung together like clothes on a laundry line. There are portraits of Muhammad Ali and Jean-Michel Basquiat, plus a series of vintage cityscapes meticulously captured over 60 years by Alex Harsley, an unsung doyen of New York photography.

The city has been Mr Harsley's home since 1948, when, aged ten, he moved there from South Carolina. He took his first photograph ten years later, and became the first black photographer to work for the city's district attorney's office. His scintillating pictures freeze moments in New York's evolution from the 1950s to the present. "It could start with the smell of something burning," he says of his method. "And then you see a family sitting on the steps of a funeral home pensively looking at the firemen going through their routine."

Some of the scenes in the collection were captured from the window of his old apartment in Harlem; they include images of black activists, streets submerged in snow and shots of the Crown Heights riots of 1991. A.D. Coleman, a photography critic, says Mr Harsley has been able to capture the lives of minority groups by making himself "invisible". His aim has been to assemble these fragments into an extended history of the city.

Mr Harsley's gallery is a time capsule. But, as it has been for decades, it is also a hub for the city's artistic underworld. In the 1970s New York's photography scene was flourishing, but exclusive. As Mr Harsley puts it, "a number of great artists were swept aside" because they lacked connections. Nurturing talent became part of his mission. In 1971 he established The Minority Photographers, an outfit that helps up-and-coming artists exhibit their work. He opened his gallery two years later; many photographers have had their first shows there. Mr Harsley curated work by Andres Serrano and David Hammons, among others. "It was kind of a school for me," says Dawoud Bey, a photographer and one of the beneficiaries; "a one-room schoolhouse in the East Village."

"Sit down, start talking," Mr Harsley would tell his visitors. In recent years, though, the neighbourhood around his gallery has changed as rents have risen. Some venerable retailers have been forced out. But Mr Harsley, who turned 80 last year, describes himself as a survivor. On warm mornings he still pedals his bicycle across the George Washington Bridge; the vintage sports car he parks in front of the gallery is a neighbourhood attraction. These days he works late as he digitises his archive, and keeps the doors open till midnight. "The Lower East Side keeps me in line," he laughs.



Summer on East 4th Street