

**ALL-SEEING:**  
(left) a ScanEagle  
“unmanned aerial  
vehicle”, originally  
developed to help  
fishing boats track  
schools of tuna, now a  
military reconnaissance  
mainstay; (below)  
P.W. Singer.

# GAME OF DRONES

**P.W. Singer's predictions about 21st-century warfare – robots, child soldiers, unmanned drones controlled by the click of a mouse – were dismissed as fanciful 20 years ago. Today, the US military (as well as Hollywood) is listening hard to the 40 year-old maverick.** BY NICK BRYANT

**T**HE OLD ADAGE has it that generals always make the mistake of fighting the last war. P.W. Singer has built his reputation as one of America's foremost thinkers on conflict in the 21st century by arguing that the next war is already being fought. In the crusty world of Washington thinktanks, a gerontocracy of retired defence chiefs, balding diplomats and one-time West Wingers, this 40-year-old policy wonk cuts a dashing figure. Wearing sharp suits and open-necked shirts, a rarity still at workplaces within DC's insular Beltway, Singer looks more like the head of a Silicon Valley start-up, a mover and shaker who belongs in the pages of *Esquire* rather than that venerable journal of geopolitics, *Foreign Affairs*.

On the morning we meet in his office, a few blocks from the White House, he is about to head off to address a group of fighter pilots at a US Air Force conference. But he has also touched base with a production team in Los Angeles about his next TV project; he has worked as an adviser for HBO and DreamWorks.

As for his latest book, it is not some lifeless treatise on the global balance of power, but an action-packed novel entitled *Ghost Fleet*, which imagines how a third world war might play out. "It's got the strangest set of blurbs and reviews in history," he laughs. "Everyone from the head of the US navy to the writer of *Game of Thrones*, the *Journal of Strategic Studies* to *Playboy* magazine."

But Singer takes pride in leaving his footprint in so many divergent realms. "I love working at the intersection of politics, technology, pop culture and military," he tells me. "It allows me to scratch very different parts of my brain and engage with very different people and have very different conversations."

At least people are paying attention. When Singer was a graduate student at Harvard University in the mid-1990s, a professor treated him with academic disdain when he outlined his plan to write a doctoral thesis on how private security contractors were changing the face of modern warfare. "We used to have someone like you when I was in graduate school," the professor said witheringly, "and he went off to be a Hollywood writer." But Singer parleyed his doctoral thesis into the seminal book on the subject, *Corporate Warriors: the Rise of the Privatized Military Industry*. Published in 2003, it anticipated the problems and scandals that private contractors like Blackwater would soon run into in Iraq and elsewhere.

A sharp-eyed spotter of clear and present dangers, Singer is to 21st-century warfare what the thinker Malcolm Gladwell, the author of classics like *The Tipping Point* and *Blink*, is to group psychology and behavioural economics. The Smithsonian Institution has placed him among America's top 100 innovators. *Foreign Policy* magazine has ranked him in the top 100 global thinkers. *The Wall Street Journal*, a newspaper usually meagre with its praise, describes him as "the premier futurist in the national-security environment";

although he does not particularly like the term futurist, partly because he believes the future is already upon us.

According to his friend Michael Fullilove, the executive director of the Lowy Institute for International Policy, "Peter is a rare bird in the thinktank world: a policy entrepreneur. He has an impressive record of identifying emerging security issues – including child soldiers, corporate warriors, and robots – just before they crystallise."

A prolific author, Singer's books read like self-help manuals for defence and security chiefs. Yet, as that early encounter at Harvard illustrates, persuading "old farts" to take his ideas seriously has not always been easy. At a defence conference in Washington only a decade ago, just as he was finishing his definitive book on the subject, *Wired for War: the Robotics Revolution and Conflict in the 21st Century*, he was astounded that no one used the words "unmanned" or "robotic".

On a visit to Canberra in 2009, he had a similar experience: "I remember arguing with military officers in Australia that you would be buying drones and you are not only going to be buying F-35s [fighter jets] for the next 30 years." Again, they didn't believe him.

Today, the US has more than 10,000 drones in the air, and so many ground-based robotic devices that there is no longer an official count. Among its most successful drone pilots is a high-school drop-out, who took to the job so effortlessly because he had spent so much time as a child playing Xbox video games.

The idea for Singer's latest work of non-fiction, *Cybersecurity and Cyberwar: What Everyone Needs to Know*, which he wrote in collaboration with another expert in the field, Allan Friedman, came during a briefing at the US State Department. At the outset of the meeting, one of America's highest-ranking diplomats asked him to describe, with an air of unapologetic befuddlement, "all this cyber stuff".

The book was not so much the product of inspiration, then, as exasperation with "old farts". Much to his annoyance, the diplomatic and defence establishment remains heavily populated with fossilised figures like the former FBI director who, as late as 2001, did not have a computer in his office; the head of US Homeland Security, who told him, "Don't laugh, but I don't use email at all"; or the cybersecurity tsar in Australia who had never heard of Tor, the system beloved by fraudsters, terrorists and paedophiles that allows for anonymous communication in the darker, unregulated reaches of the internet.

P.W. Singer likens them to the field marshals at the end of the 19th century who were adamant that machine guns were no match for a daring cavalry charge, or the British naval commanders who publicly ridiculed the novelist Arthur Conan Doyle for warning that submarines could torpedo surface vessels. "I try to identify key changes that are happening now and key trends that will shape future worlds," he says, "and

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The US has been on the receiving end, too. The computer networks of its F-35 stealth plane have already been penetrated at least three times. In another case, a foreign intelligence agency left USB flash drives in the car park of an American base in the hope that a US soldier would pick it up and plug it into his computer at work. The “candy drop” worked a treat. Once inserted, the flash drive uploaded a worm into the US military’s central command network, which immediately started creating what are called “back doors”, so that they were easily accessed from afar. Cleaning out their system took the Pentagon 14 months.

Cyber-warfare, as Singer gleefully points out, can be conducted at an almost comically simple level. As far back as 1989, officials at NASA and the US Department of Energy discovered they had been “WANKed”. All of their computer screens displayed the message: “WANK: Worms Against Nuclear Killers.” It was the work of young Australian hackers.

More recently, British defence officials have been duped into accepting fake friend requests from a false Facebook account that purportedly belonged to an admiral.

It’s warfare with a click of a mouse, and can also involve something as banal as altering barcodes on shipping containers, so that reams of toilet paper are delivered to the frontline rather than guns and ammunition. Chinese hackers have even managed to weaponise thermostats and office printers so that they can relay messages back to Beijing.

## SINGER’S WORLD



### ON MORALITY

Not to be confused with the Australian ethicist Peter Singer, Peter W. Singer is concerned with the morality of robo-warfare, the future of which his bestselling book *Wired for War* explores. “We’re getting incredible science fiction-like capabilities, but we also have incredible science fiction-like dilemmas to figure out,” he says. How, for instance, does the Geneva Convention apply when a Predator Drone strike goes awry?

### ON “WARBOTS”

“Robots are emotionless, so they don’t get upset if their buddy is killed,” he says. “They don’t commit crimes of rage and revenge. They see an 80-year-old grandmother in a wheelchair the same way they see a T80 tank; they’re both just a series of zeros and ones.”

“ I try to identify key trends that will shape future worlds, and often they are the ones that people struggle to get their heads around because they don’t fit their world view. ”

often they are the ones that people struggle to get their heads around because they don’t fit their world view.” He likes to quote an article in the *New York Times* from the turn of the last century that predicted it would be between one and 10 million years before man took flight. That very day, the Wright brothers assembled their first flying machine.

In prominent display on his desk is a model of an X47, a robotic plane resembling a stealth bomber, which has managed to successfully take off and land from a US aircraft carrier. “Just a few years ago, they said it couldn’t be done,” he says.

As for “all this cyber stuff”, it is, as his writings chronicle, old news. Already, the US has managed to set Iran’s nuclear program back years, not by carrying out bombing raids – which probably would have been ineffective in any case, because so many facilities are housed in bunkers – but by throwing a giant digital spanner into the works. Iranian computers were infected with malware that enabled the Americans to make tiny adjustments to the centrifuges designed to enrich uranium so that they careered out of control. What Iranian nuclear scientists thought were teething problems was actually a cyber-attack orchestrated from Washington. For more than a year, they had no idea that their computers had been compromised.

**THOUGH SINGER** has been sounding the alarm for years, cyber-warfare does not get anywhere near the urgent attention it warrants. Of the Fortune 500 companies, for instance, 97 per cent have been hacked. The other 3 per cent probably have been, too, but have yet to realise it. “The average time a victim takes to find out they are under attack is 205 days after it began,” says Singer.

The challenge is to keep ahead of the hackers in this digital game of whack-a-mole, but it’s a thankless task. In 2010, the digital protection firm McAfee discovered a new version of malware every 15 minutes. By 2013, it was uncovering a new specimen every second. So competitive is this space that, as Singer notes in *Cybersecurity and Cyberwar*, China now conducts regional hacker competitions to identify and then recruit the best talent – one winner had mounted a successful attack on the White House website.

Reassuringly, though, Singer believes fears of a “cyber 9/11” are overblown. “Cyber-terrorism is like Discovery Channel’s ‘Shark Week,’” he notes, adding that people are 15,000 times more likely to be hurt or killed in an accident involving a toilet than mauled by a shark. “Squirrels have taken Wall Street offline on three separate occasions. Hackers have done it zero times,” he adds. “It’s not that there isn’t a risk. It’s about how you manage the risk.”

Born into a military family, Singer’s fascination with war came from growing up surrounded by the medals and insignia of his father, an army officer. In his bedroom was a model of the warplane his uncle flew over Vietnam, which the young Singer used to strafe his Lego towns. In his office is a photograph of his grandfather’s battleship passing underneath San Francisco’s Golden Gate Bridge during World War II. “I was the little boy



where a stick became a lightsaber, or a tommy gun with which he'd stop the Nazi attackers," he recalls. A bright student, Singer's education was Ivy League, Princeton and Harvard. After being awarded his PhD, he became the youngest fellow at one of Washington's most august foreign-policy thinktanks, the Brookings Institution, and was earmarked as a high-flyer.

During the 2008 presidential campaign, he coordinated Barack Obama's defence team, though he did not join the new administration, partly because the inauguration coincided with the publication of his breakthrough book, *Wired for War*. Not only did this bestseller on "warbots" become what he calls "the centrepiece of American defence policy and warfare", but it caught the eye of figures like Jon Stewart, the then-host of *The Daily Show*. "Blew my f...ing mind," was Stewart's take on a study that chronicled the end of man's 5000-year monopoly on warfare. Now it is official reading in the US military, as well as the Royal Australian Navy.

Singer's current post is as the strategist and senior fellow at the New America Foundation, a non-partisan thinktank specialising in national security and technology, whose chairman is Google boss Eric Schmidt.

**A** LONG WITH DESCRIBING the nuts and bolts of modern-day warfare, or more aptly its circuitry and gadgetry, Singer has made sure not to neglect its human consequences. In *Wired for War*, he wrote about the rise of cubicle warriors: drone operators who carry out attacks on targets in Afghanistan and Pakistan remotely from bases half a planet away outside Las Vegas. In this not-very-brave world of remote war, he was also among the first to study how they suffered from post-traumatic stress disorder more so than even frontline combat troops. Though these operators are disconnected physically from the battlefield, the close-up imagery that enabled them to identify their targets also enabled them to see what death and destruction they had wrought.

Singer's work on the increased reliance upon child soldiers resulted in changes in how UN peacekeepers are trained. He credits his father, who worked as a JAG, a judge advocate general (military lawyer), for vesting him with an interest in the ethics and legalities of war.

"JAG." We had been talking in his office for more than an hour before Singer deployed his first acronym, which is surely something of a record in Washington wonk-world. But although his books are packed with jargon – "asymmetric cryptography", "advanced persistent threats", "poor access control" (which, incidentally, is how former US soldier and WikiLeaks source Bradley – now Chelsea – Manning managed to pull off what was possibly the largest data spillage in American history while listening to Lady Gaga's *Telephone*) and "ultra-co-ordinated motherf...ery", a term used by politically motivated "hacktivists" – his aim has been to engage as broad an audience as possible. It also explains his forays into popular culture and his fictional debut.

*Ghost Fleet: A Novel of the Next World War*, which he co-authored with August Cole, is a story in which a post-communist Chinese government uses its technological smarts to destroy America's aircraft carriers, satellites and submarines and disable its computer systems. Then it invades Hawaii, giving Beijing control of a Pacific Ocean rich with newly discovered energy reserves.

*Ghost Fleet* will not be a contender for any literary awards. It's the sort of the book that one expects to feature the author's name in bold, silver letters slightly elevated from the cover. But that is hardly the point. Its

main purpose is to popularise the idea that for all the focus on what are sometimes called the "cool wars" of the 21st century, where the battlefield would be cyberspace, a full-scale global conflagration could still arise from an old-style clash between major powers: "The return of great power politics," as Singer puts it, "and with it the risk of powerful states going to war". The spark for wars could be a small-scale event or accident, such as a Russian bomber plane probing British airspace, skirmishing with a Royal Air Force jet sent up to intercept it.

Such thinking can hardly be described as new. Western defence chiefs have for years been fretting about the growing belligerence of Russian President Vladimir Putin and the rise of a China determined to exert a measure of regional influence commensurate



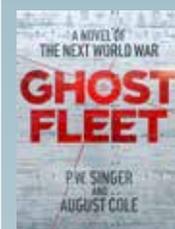
**OFFICE JOB:** drone operators or "cubicle warriors" steer attacks on targets on the other side of the planet.

with its economic might. But, as with his earlier titles, Singer has timed his run well in bringing out a book just as the subject is front and centre. On the morning we met, an American destroyer had sailed close to China's new artificial island in the contested waters of the South China Sea, while Russian warplanes were in action in the skies above Syria.

His new focus on an old problem, Great Game geopolitics, also underscores his dislike for the term "futurist". "There's the thing coming at you that you need to pay attention to," he says. "But it's also a case of keeping an eye on the horizon behind you so that you can draw lessons from the past and not repeat the mistakes of the past."

Maybe Singer hoped his novel would be ridiculed, much like Arthur Conan Doyle's warnings about the threat from submarines. *Ghost Fleet* questions, for instance, the future role of aircraft carriers, upon whose floating flight decks America's post-war military hegemony has been built. But quite the opposite has happened. As well as being favourably reviewed in *The Economist*, the parish pump of the global intelligentsia, the novel was discussed last month at a congressional hearing on Capitol Hill, where the Senate Armed Services Committee became, for a few hours, a parliamentary book club.

Though renowned as a futurist, Singer is sheepish when it comes to discussing what lies in store for him personally. Should Hillary Clinton win the US presidency, he would be a likely candidate for a role on the National Security Council or some kind of position at the Pentagon. For now, though, he seems happy in his work. Advising Top Gun pilots. Hanging out with HBO. Talking about his novel on Capitol Hill. Sitting in the seat where popular culture and policy intersect. ■



## ON WORLD WAR III

Following four influential and award-winning non-fiction works, Singer's first novel *Ghost*

*Fleet*, co-written with August Cole, imagines a World War III between China, the US and Russia, fought with weapons ranging from robot drones to old warships, in the theatres of cyberspace and outer space as well as land, air and sea. "A thrilling trip through a terrifyingly plausible tomorrow," gushed one reviewer.

## ON THE LIGHT SIDE

A prolific Twitter user, Singer's "half-serious tweets" include sneak peeks inside luxury bomb shelters for billionaires, a photo of a drone dressed up for Halloween and an alarming picture of a chocolate-stuffed hamburger (below).



## ON HIS OTHER DAY JOB

NeoLuddite is Singer's "boutique technology and trends" consulting firm, its clients ranging from the FBI and the US military to major film studios including DreamWorks and Universal. As a consultant for *Call of Duty: Black Ops II*, Singer worked on a drone concept for the popular video game, a quadcopter called Charlene (below). "Now, defence contractors are trying to make Charlene real," he said in 2013.

