

Drones, smart munitions and cyberspace: 21st century defence of Ukraine & implications for Australia

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Introduction

Susan Pond: This open lecture¹ delivered by Major General (rtd) Fergus or Gus McLachlan AO FRSN is on the very topical subject of drones, smart munitions and cyber space, the 21st-century defence of Ukraine, and its implications for Australia. Gus tells me he's had a busy day, including just leaving the stage of "The Drum."² Gus retired from the Australian Defence Force in 2018. He held several senior appointments in the Army, including responsibility for modernization and strategic planning. He created the first Army cyber capability, introduced reconnaissance drones, and commenced the creation of a deployable digital command-and-control system, in other words, a military Internet of things. Gus's last appointment in the Army was as commander of Land Forces Command, which comprised 36,000 women and men in roles as diverse as helicopter crews, tank and artillery units, logistics and satellite communications.

He saw active service in Syria, Lebanon, Iraq, and Afghanistan. Gus now serves in executive and advisory roles in the defence

industry, private equity, cyber security, and information systems companies. I'm also pleased to introduce Colonel (rtd) Andrew Condon CSC, Industry Professor for veterans and their families at the Australian Catholic University where he has been for a year. Andrew will conduct a conversation with Gus after his presentation. Andrew's a former CEO of Legacy and chair of RSL LifeCare aged care. He currently serves on the federal government's Aged Care Advisory Board. Gus, welcome to the stage, and, Andrew, you'll follow to conduct the Inquisition and also to ask for questions from the audience. Welcome.

Gus McLachlan: Well, thank you very much for having me. I think it's a very important topic and I think in a well-informed democracy, we need to take the time to understand what's happening in places like Ukraine, which might seem a long way away, but with the sort of storm clouds of instability growing over the region, I think the more we understand about the way war is being shaped by technology, the better the decisions we will make.

1 This paper is derived from a presentation to the Royal Society, at the State Library of NSW, on 1 February 2023 (Ordinary General Meeting number 1310).

2 See <https://www.abc.net.au/news/programs/the-drum> [Ed.]

Past and future tank battles

Mark Twain famously said that history doesn't repeat, but it rhymes. And in the late summer of 1943, the largest tank battle in history took place on the plains of Eastern Europe, east of Kyiv, at a place called Kursk. The Soviet counter attack against the German invading force was ultimately successful. And to this day is regarded as the largest tank battle in history.

It's likely that this (northern) summer will echo with tank battles in the same area, and it's through this lens that we need to understand the imminent decisions that people like Olaf Scholz are making as the Chancellor of Germany about the trepidation he feels as a leader of a country, deeply scarred, by providing German tanks that rumble across the plains of Europe as he makes decisions about whether to contribute those tanks to the ultimate liberation of Ukraine. We're 12 months into a land war, and there are numerous things that we are learning about the impact of technology on the war, and, sadly, one of the things we're also learning is that a whole lot has not changed.

So, what are we seeing? It's important we talk a little about the impact of technology on the war, but I think it's also important we spend some time on the origin to the conflict. Andrew and I are very conscious of the experience and wisdom in this audience.

Origins of the war

Please allow me to go back over a little bit of time. Olaf Scholz said, soon after the Russian invasion, that the invasion ultimately ended 40 years of unipolar US leadership. I think it's important to understand this challenge to the Western system that we have benefited from so generously, with

things like global trade, uninterrupted supply chains and a relatively benign period of US leadership that are now appears to be over. The Russian foreign minister, Sergey Lavrov, went as far as to say "the US wants a unipolar world, not a global village, but a US village. We're not closing the door on the West, they're closing the door on us." And Putin himself, interestingly, 90 minutes late in his address to his nation as a result of "hactivism" — I'll talk a little bit more about that soon — said that "the US believe they represent God on earth. Everything else is a colony or a backyard."

The United Nations General Assembly has voted twice to discuss the issue of condemning the Russian aggression in Ukraine. And as recently as a speech in Canada, the US Secretary of Defense celebrated the fact that, of the 193 countries, 141 chose to condemn the Russian invasion and condemn Russian behaviour: only five countries supported Russia's behaviour. That included countries like North Korea. But 35 countries abstained, and in that 35 countries is 50% of the world's population — China, India, Pakistan, Vietnam, South Africa, for example — all chose to abstain on the question of the ultimate morality of the Russian invasion.

I think it's important for us all to understand that this view of the benefit of 40 years of unipolar US leadership is not universally perceived. So this period — the second period of globalization, as it's being called — looks like it's over. There is much industry analysis around the end of just-in-time supply chains, moving to "friendly-in-time," or to holding stocks. We'll leave that for another discussion. But, through my period of military professional education and development, we followed kind of two schools of thought.

Francis Fukuyama, the American academic posited that the demise of the Berlin Wall and the end of the Soviet Union represented the end of history.³ And that the liberal democratic world order supported by the mechanisms of capitalism meant that, in real terms, history was over: it was inevitable that those things would prevail. Sam Huntington, interestingly Fukuyama's professor, took a different view:⁴ he said that it is ultimately the case that civilizations will clash, and that the real conflict was still to come. Now, lots of people contest Huntington's division of the sort of cultural landscape. And I'm one that accepts that it was far from perfect.

But, really interestingly, the fault line down the eastern side of Ukraine, with the Orthodox Russian side on the East and the Catholic European view of Christianity on the West, has clearly played into Putin's understanding of what would happen when he invaded Ukraine. Putin clearly believed that that fault line would fracture, and that the Orthodox, predominantly Russian-speaking, people in the east of the country would welcome him and the invading force with garlands of flowers. And that's clearly not been the case. So again, let's just briefly explore some of the background by zooming out to the strategic level.

In one of my roles in the military I was seconded to the Pentagon in Washington to work on the first defence policy statement of the Obama administration. Only two countries asked to participate in that activity — the Brits and us — and this represents the very special relationship we have with

our main alliance partner. US presidents are obliged by law to release a policy statement in the first year of their administration, unlike in Australia, where governments can choose to release a defence white paper when circumstances change.

What's really significant in the Biden quadrennial defence review is that the Biden administration admitted for the first time that the US was incapable of winning two wars at once. US defence policy for decades had been that they, as the main global superpower, were capable of winning two wars at once, understanding that that might mean a war in Europe, and it might mean a war in the Asia-Pacific. Biden admitted what most of us professionals had known for some time; that that was impossible. In fact, most of us had known that perhaps the Americans could hold or support one area of conflict and arguably win in another. And it's into that new US uncertainty that Xi Jinping and Vladimir Putin, as two leaders who are interested in bifurcation of global systems and of ending this period of unipolar American leadership, have stepped in to exploit that challenge.

So, US policy is now largely designed — to the extent they can hold the situation in Europe — to enable a Ukrainian victory, whilst keeping their eyes on the far more difficult challenge of an emergent and increasingly confident and belligerent China.⁵ This bifurcation of global systems has a political and a philosophical bent, but it also has a technological bent. The Huawei efforts to dominate the rollout of the 5G networks and global internet systems are

3 In his article, Fukuyama (1989), and later his book.

4 In his article, Huntington (1993), and later book.

5 See White (2023). [Ed.]

a clear attempt for China to take the lead of those technical systems. We're seeing the SWIFT mechanisms of global internet payment systems under threat by alternate Chinese pathways, and Chinese challenges to the World Bank, and other things. So those leaders who challenge this US period of leadership are fundamentally seeking an alternate organization.

The war in Ukraine

Let's talk a little now about Ukraine. While Putin had ambitions (many of which were imperialist ambitions that dated back to the 12th century — Russian myth-making, perhaps), he chose to pick a fight with a genuine 21st-century leader. My argument is that we are seeing a war between a 20th-century leadership construct in Russia and a 21st-century leadership construct in Ukraine. Putin commenced what he called a special military operation without mobilisation. And, for people like Andrew and me, there were clear indications in that about Putin's understanding and ambition mobilised about 290,000 troops and positioning them in the snow at the borders of Ukraine.

It was pretty clear that he intended to invade. That was about 65% of the Russian standing army, meaning that it's a one-shot opportunity. There's no spare army with which to rotate those forces. There wasn't at the time — military planners do a basic set of what we call mathematical tactics, or force ratios. When I looked at something close to 200,000 troops on the border, we knew that the Ukrainians actually were capable of fielding an army of about 200,000 people. It was pretty clear to military professionals that, despite what we perceived as Russian technological and perhaps profes-

sional advantage, they didn't have the force to overrun all of Ukraine.

Putin's advisors might have been telling him that there was likely to be this social collapse, with garlands thrown in front of soldiers as they marched on Kyiv. But the reality of the force ratios and the mechanics of the war that he faced meant that it was unlikely that he would be successful. And I sadly said in forums like this, almost a year ago — while some commentators were saying the war would be over in three weeks — that we'll still be talking about this at Christmas, meaning Christmas 2022. Well, sadly, I'm now going to say to you tonight that I think we're still going to be talking about this at Christmas 2023. I think we're entering possibly the most dangerous phase of the war.

Three phases of the war so far

Broadly, there have been at least three phases of the war so far — first, what I'd call *the battle for Kyiv*, which, which was almost immediately unsuccessful. There was the Russian withdrawal, and reversion to a phase I call *fire and movement*: the Russians would bombard a thousand metres in front of their troops for 24 hours, and they would advance a kilometre, destroying infrastructure, homes, people and troops as they went. That was a dangerous and difficult period for the Ukrainians because, even though their soldiers were better trained, they lacked the ability to reach Russian artillery and Russian logistics. They were in a dire position. Fortunately for them, the West responded — and we'll talk a bit more about how the West responded — in terms of providing equipment and support.

The next phase of the war I call *the Ukrainian local counterattacks*. And we saw a very

significant counterattack in the summer that removed the Russians from probably 10 or 15% of the captured territory. In my opinion, that gave Zelensky time to pursue all-out defeat of the Russians, because, prior to that success, I think that it was likely that people like the French president Emmanuel Macron and the German chancellor Olaf Scholz were starting to manoeuvre towards negotiations with the Russians over a negotiated settlement. The barbarity of the Russian attacks became clear in this period. There were atrocities committed in villages before they withdrew. And there were very significant attacks on infrastructure, which continue.

The fourth phase is what we are building towards now. And that's what I'd call *the strategic counterattack*, where the Ukrainians are seeking to build up the capacity to actually evict the Russians from their country. Remember those force ratios that I talked about before — simple, broad military planning mathematics — a defender is expected to be able to stop probably three to five attackers.

Think about the defenders' advantage: they are on home ground. They've probably had a chance to prepare defences to dig in and get below ground. They have resupplies on what are called interior lines. So it's generally expected that a defender will be able to stop a greater number of attackers. That's what we saw with the professional performance of the Ukrainian army. Under considerable threat, they were able to force and ultimately cause the Russians to grind to a halt.

But the polarity of that force ratio now reverses, and we have a situation where, if

the Ukrainians are to evict the Russians from their country, they're going to need at least to be able to generate local advantage of three to five times the troops that are available on the Russian side, which is going to be very difficult. This, of course, leads to the discussion around systems like the provision of tanks and other things, which I'll get to in a moment.

A dangerous counterattack phase

I therefore anticipate a very dangerous and dramatic period where we'll see counterattacks from the Russians, now led by this Wagner group of mercenaries who are throwing conscripted young soldiers into a fight. 200,000 young Russians have been mobilised, with very little training. They are literally being forced into advances. And it's highly likely there are Wagner soldiers at the back of their formations, threatening to shoot them from behind if they turn around and run away. And they'll be telling the hapless recruits that "at least you've got some chance of living if you continue to attack." So a very brutal period.⁶

Volodymyr Zelensky, a 21st-century leader, is agile. He knows how to communicate. Everyone knows that he was a former comedian. Interestingly, he's more on "The Chaser" style of comedian, so politically aware, smart, sharp, savvy — he topped his law school at university. It's possible to argue that he wasn't being a particularly successful peacetime leader, since Ukraine is a difficult country to govern, with lots of endemic corruption. But cometh the hour, cometh the man. And what we've seen is a leader who is capable of a level of sophistication in modern communication that I don't

⁶ See Renwick (2023). [Ed.]

think we've seen before. I think we will look back on him as almost a Churchillian figure in terms of his ability to mobilise support for his country. His communications are on agile multi-platform multimedia, tailored to the audience, TikTok sound bites, short, sharp penetrating commentary, while his adversary is giving 90-minute rambling speeches on traditional platforms that nobody is listening to.

The cyber war

Zelensky knew he had to preserve the information networks of his country in order to get those messages out. They knew the Russian invasion was coming. Cyber defence was planned ahead. Data was offshored into global cloud capacity. Applications for running their government were offshored into global cloud capability. They mobilised the agencies of the West to help them prepare their cyber defences: the National Security Agency (NSA) in the US, GCHQ in the UK and, and the Australian Signals Directorate. You may recall Prime Minister Morrison at the time saying that we would provide cyber support. What he was talking about was this support to help keep alive this communications layer in Ukraine.

I'm an adjunct professor at Monash University. There's a wonderful institution at Monash, part of what is known as the Internet Observatory,⁷ which monitors internet performance for evidence of state-sponsored reduction. They tracked the Ukrainian internet performance throughout this period, and the lowest level of function of the Ukrainian internet and communications architecture was degraded to was about 85% of capacity,

which was a remarkable achievement, given the former superpower's capacity that was thrown at them. That fight is not over, by the way: we are seeing a significant rallying of Russian capacity, including trying to strike at those agencies and companies and countries that have supported Ukraine. So there's likely some attention for Australia in that process. But ultimately Zelensky's critical vulnerability is Western attention and Western engagement, which leads to material support for his army. Remarkably, he's been able to keep the West aligned with that process.

We have very current representations of the state of play on the ground. Interestingly, they're from an organization called the Institute for the Study of War,⁸ one of a number of organizations that are providing an outstanding level of analysis on what is happening in the war. They provide a platform for a fairly clear understanding for people like me to be able to follow the conflict in a way that is really quite remarkable. It is empowered by a new level of open-source intelligence that is unprecedented. I think I know more about what's happening on the ground in Ukraine than I did when I was a general on the ground in Afghanistan. Which was not that long ago. The level of pervasive, hand-based phone imagery coverage goes right down to the cheap Chinese tyres on the logistic convoys that are bursting in the snow and causing tailbacks of Russian convoys that can then be attacked.

We're seeing drone footage and disposition maps with a level of granularity that's really quite extraordinary. You'll hear the

⁷ See Ackerman et al. (2017) [Ed.]

⁸ <https://www.understandingwar.org> [Ed.]

term OS INT — open-source intelligence.⁹ We've got to be careful because it's not analysis, it's information, and it's being manipulated, in this case we think by the good guys. So Zelensky is being very careful to make sure there's free access to this sort of imagery, giving a positive depiction of what the Ukrainians are facing. Sadly, he necessarily has to restrict our understanding of how many casualties the Ukrainian forces are taking, which has been very, very significant. So, it is not really intelligence, but it is certainly unprecedented information. The UK head of GCHQ, the British Cyber Intelligence Agency, Jeremy Fleming, in a visit to Australia last year, said in his opinion the pace of declassification of the information provided by the intelligence agencies is unprecedented.¹⁰

And it's been picked up by organizations and promulgated in a way that all of us (and people like me) can consume. Fleming goes on to say — which I think is really significant — that intelligence is only worth collecting if it's used. And in this case, it's being used to pre-empt Russian action. So if we are reporting that it's likely the Russians are going to try and create a dirty bomb from the former Chernobyl nuclear facility, with credible intelligence, it provides a significant disincentive for the Ukrainians to do so. Another significant element of these layers of support.

We've talked about state-sponsored agencies, the cyber agencies of the Five Eyes countries, but we've also had this exciting emergence of a thing I call *Hactivism*. The "white hat" hackers of the world, many of whom work in banks for intrusion

detection, you know, testing code et cetera, have rallied behind this cause in a way that we haven't seen before. I described Putin's speech as being delayed for 90 minutes. It was not delayed by Western intelligence agencies, but by white-hat hackers, who wanted to make a mockery of Putin and the Russians' ability to defend his network.

We expected cyber attacks from the Russians. When we studied the Russian invasion of Georgia, we saw — prior to Russian troops going across the border — things like the telco networks being pulled down, traffic signals, power and distribution, even the functioning of hospitals all disabled in cyberspace before physical troops came across the border. But, as I said, in this case, there was significant anticipation of that by the Ukrainian government.

Industry cyber support and Starlink

The other piece I didn't talk about — we've talked about the state-based agencies, and we've talked about hacktivism — but we've also seen industry stepping up in a way that is quite remarkable, that is, picking sides. Microsoft, as an example, has done an extraordinary role, working with the Ukrainian government to preserve the functioning of their government. They set up a cyber operations centre that specifically watches Ukraine. They are seeing the attacks the Russians are making and rapidly deploying patches that remove those vulnerabilities in real time from the Ukrainian government agencies.

Now, when you're a country that's trying to deal with up to 4 million displaced civilians, tracking where your citizens are,

⁹ See <https://www.csoonline.com/article/3445357/what-is-osint-top-open-source-intelligence-tools.html> [Ed.]

¹⁰ Director GCHQ Sir Jeremy Fleming's full speech from the Australian National University (Thursday 31 March 2022) <https://www.gchq.gov.uk/speech/director-gchq-global-security-amid-russia-invasion-of-ukraine> [Ed.]

understanding the attacks to your infrastructure, you can imagine how critically important that support has been. Russia and China have proven to be quite adept at offensive cyber — that is, the ability to steal intellectual property to disrupt — but I don't think they anticipated the need to establish their own defences, and they've proven to be quite vulnerable to the offensive cyber activities that have followed them.

Starlink is a system of low-orbit Earth satellites, launched by Elon Musk.¹¹ I think there were probably 2,000 satellites in orbit, and it may grow to about 8,000 over time. Musk donated — or at least made available, I think the Ukrainians are probably paying for, or the American government is on behalf of the Ukrainian government — these terminals so that the functioning of the Ukrainian government could continue. And, while I'm going to talk about their military use, let's look at a non-military use. There were passport-issuing checkpoints at key railway stations. 4 million people displaced, leaving to go outside the country, to travel all over the world, many of whom had never left the country, and didn't have passports. Without internet connectivity through Starlink and the ability to process, this would simply have been a shambles. It's an interesting example of what Starlink was able to provide.

How significant has Starlink been militarily for Ukrainian forces? While 85% of the communications infrastructure of Ukraine has been maintained, out in the field, where the military are, there's very little infrastructure, and communications would've been incredibly difficult. In fact, the Russians

have been enormously challenged by the ranges that they've dealt with, which is why their generals have been taking out their mobile phones trying to resolve issues. The three-letter agencies in the United States, such as the NSA, provided the location of those mobile phones to rocket forces of Ukraine. And five or six Russian generals were killed quite quickly.

So taking your mobile phone out at the front line for Ukrainian forces was not the option. The provision of Starlink terminals down at the frontline, very close to the combat force, has been a specific example of where technology has enabled this 21st-century force. In the face of this brutal 20th-century adversary,¹² through Starlink they've been able to create a digital mesh, an internet of things, if you like. That's a useful forum for providing information in our military. We then put a layer of protected command-and-control systems in there, and we put all sorts of checks and balances and layers and approvals in that system.

Ukraine has a very technically savvy population and workforce. What else did they do with Starlink? Drone forces were out on the front line, to identify where a Russian artillery piece was bombarding through what I called the fire-and-manoevre phase. The Ukrainians would post the location of that artillery unit effectively on an Uber-like platform through Starlink. And say, literally, "we have seen artillery at the following location." Over on the other side there was the artillery fire from Ukraine effectively shopping from that menu of targets with immediacy, able to just select a target, with no approval and mechanisms. (In Australia

11 <https://www.starlink.com> [Ed.]

12 See Renwick (2023) [Ed.]

you would have five generals, about eight colonels, 28 captains, and, you know, 15 other people get in the way.) With no layers in between, those Ukrainian artillery units have responded to the target of opportunity.

What that means is, whenever a Russian artillery unit stops to shoot, between three and five minutes later counter fire was landing where they had been standing. That's unprecedented in warfare. So you create this moment where the Russians can shoot a few rounds, but then have to pack up their guns and go within three to five minutes. They call it "shoot and scoot." Well, the reason for having to do that is the amazing adaption of Ukrainian forces utilizing the Starlink technology.

Putin has tried to disrupt the Starlink frequency. Ultimately it's a radio signal to space. But because it is relatively low-earth and because it is a direct line of sight, it's proving to be a very difficult thing to disrupt, whereas a broader-based command-and-control system that hops through a series of radios on the ground can ultimately be disrupted by electronic warfare capability.¹³

A drone war

My photo at the start was a trench, not unlike we saw in World War I, but I guess this image is 21st-century. There are soldiers, many of them militia, so many of them Ukrainian teachers, professors, engineers, bus drivers. Now in this force, hovering over them, is a commercially available drone — I think probably a DJI Chinese-made drone — and a Toyota Hilux. And their ability to infiltrate the frontline, use

that drone to spot Russian movement and then post that kind of information onto the command-and-control system is quite extraordinary. Sounds widely exciting and exotic, an incredibly dangerous operation. Again, the Russians are adapting. These drones can be heard. These forces are enormously vulnerable when the drone is in the air. And often the Russians will try to follow the drone back to where it lands, to be picked up as a Toyota Hilux races off into the distance.

This is at the bottom end of this drone war. At the top end of the drone war we've learned about the Turkish Bayraktar drone. Fascinating story in its own right again for us, with our Western focus. I confess I had not heard of this capability, but, around the world, it has been involved in more than 800 strikes in wars from North Africa to the Caucasus. It's very capable of destroying sophisticated systems like air defence, electronic warfare, radars and tanks. And in this case, the Ukrainians have bought these drones from this Turkish company. They're actually a much cheaper version of the Predator drone that Western forces used in wars in Iraq and Afghanistan. Selçuk Bayar runs a fascinating business. In Turkey they regard him as the Turkish Elon Musk, with 2 million Twitter followers, he is a celebrity in his own right. And, for that part of the global population who are not particularly enamoured by Western advanced technology and the ability to strike with impunity anywhere around the world, this fellow and his technology is regarded as something of a Robin Hood-like figure with his response

¹³ One day in October 2022, Ukrainian forces reported outages of some Starlink communication devices, apparently because Elon Musk was not happy that the technology was being used in warfare and there was an issue over payments. (Farrow, 2023) [Ed.]

ultimately to US Predator strikes.¹⁴ Fortunately for the Ukrainians, the Bayraktar TB2 has been in their inventory and not the other side's.

The Russians have similarly adopted an imported drone: the Iranian Shahed drone or the Marty drone. It's ultimately an attack or suicide drone, quite unsophisticated, with a small petrol motor. No camera but with GPS location programmed in it effectively flies itself onto a target, relatively accurately. In real terms it is a terror weapon, to suppress the Ukrainian population, and has been quite effective, unfortunately, at bringing down the Ukrainian power generation system, which is predominantly Soviet-era equipment, and therefore replacement parts, et cetera, are very difficult to obtain. So it's a strategic play that the Russians are about using their technology.

There are racing drones. If you're not aware of drone racing, it's the hottest sport for young people with incredible reflexes. Unlike me, they put a 3D visor on, and they literally fly as if they're on these drones through gates and round targets and under buildings. And they fly these bombs literally into the windows of vehicles and buildings. Those warheads are from a rocket-propelled grenade called the RPG-7, which is one of the most ubiquitous weapons on the planet.¹⁵ So instead of a soldier having to stand there and run at the tank and shoot their RPG-7, the 21st-century warrior straps it to a racing drone, and flies it in through the window.

Other weapons

There is predominantly American support, which significantly outweighs that of other countries. But Australia is, I think, in the top 10 countries providing support. Lloyd Austin, the US Secretary of Defense, has called it standing against the global politics of fear and coercion,¹⁶ meaning, if we allow "might is right" to return to the preeminent position of how human beings resolve their differences, then the global-based order that has led to a relatively peaceful planet since World War II will be completely undermined. And the Americans understand their amazing privilege of being able to fight the Russians through the population and the people of Ukraine. And it would be very interesting to see, under the new Congress, whether there are people unwise enough to start to withdraw American support, given this incredible privilege of fighting through the resolve and resilience of other people. All the Ukrainians want is the means to do so.

Then there is the Javelin. Javelin missiles have become part of the language of all of us now in the West. Technologically, this is an extraordinary missile.¹⁷ It has a seeker head that is ultimately AI- or machine-assistance-enabled. So the soldier whose knees are shaking as the Russian tanks are coming towards them just has to put the image on the tank. The seeker head then recognizes it as a tank. The soldier can fire the missiles — it's called fire and forget — and can

14 See Witt (2022). [Ed.]

15 See <https://en.wikipedia.org/wiki/RPG-7> [Ed.]

16 Words spoken by President Biden before the UN <https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/09/21/remarks-by-president-biden-before-the-77th-session-of-the-united-nations-general-assembly/> [Ed.]

17 <https://www.lockheedmartin.com/en-us/products/javelin.html>

then escape back into, you know, a hole in the ground or into a ravine behind. And the missile is on its way.

Now, tank designers have known about missiles for a while, so they put all the heavy armour in the front of the vehicle as it advances forward. Javelin says, “I know your tricks, thank you.” And it pops itself up, and then flies down through the thinly skinned roof of the vehicle. Quite an extraordinary system. Some 86% of missiles fired have hit their target, which, again, is an extraordinary level of success. But the reality for us in the Western Alliance is that about 40,000 of these missiles have been made, but production has stopped, and about half of global available stocks — those not fired in training — have been consumed in the war in Ukraine. And it’s interesting, there’s been a subtle shift of American support away from systems like the Javelin and into things like artillery. And that’s because they’re running out.

I mentioned the prospect of two conflicts that the Americans had to deal with. One might be in the Asia-Pacific. So we’ve seen a quiet shift away from the provision of the Javelin, a remarkable missile. Other systems? The Stinger¹⁸ is a similarly capable missile for firing at aircraft, which is the reason the Russians haven’t been able to achieve complete superiority over the Ukraine Air Force.

And we saw another system enter our language. Who knew that Australians would know what a HIMARS system was? This a high-mobility artillery rocket system.¹⁹ This is probably the game changer that allowed the shift that ended that period of fire-and-

movement in which we saw that barbaric crushing behaviour of the Russians, with former Soviet artillery and stock holdings.

The HIMARS system has been able to strike at Russian logistics and artillery systems, and we’ve seen a more than 50% drop-off in the amount of artillery that the Russians have been able to fire back in return. It is very significant that its range is 45 kilometres. And the Americans have made very clear to the Ukrainians that it is fired inside the borders of Ukraine only. This is all about the fear of escalation and potential nuclear retaliation. There is a longer-range version of this missile that will reach up to 500 kilometres. You can imagine how much the Ukrainians would like to get hold of that, which would allow them to strike deep into Russia when things like trains full of artillery ammunition or logistic resupply are moving forward. For now, the Americans have constrained the conflict within the country of Ukraine itself.

Tanks

I’ll finish on the Germans. If you’d listened to the narrative about a year ago, the tank was finished in the history of warfare. 3000-odd Russian tanks have been destroyed, a pretty damning indictment on the Western system, and it was probably reasonable to assume that its days in modern warfare were over. So why is it that the Ukrainians are so desperate to get hold of Western tanks? Of that 3000, we know about half were abandoned by poor conscripts who had no interest in dying in the face of a Javelin missile, so they parked up beside the road, popped out the hatch and took off. We saw

18 <https://www.raytheonmissilesanddefense.com/what-we-do/land-warfare/precision-weapons/stinger-missile>

19 <https://www.lockheedmartin.com/en-us/products/himars.html>

images of Ukrainians with their farm tractors stealing those vehicles. But about 1500 were destroyed by systems like the Javelin.

A tank employed poorly is a very vulnerable weapon system. But a tank such as the Challenger, the Leopard, or the Abrams employed within a well-trained army like the Ukrainians are, is absolutely critical to achieve that combat power-ratio advantage that I talked about. As they go into offence, if they can't achieve a three-to-one numerical advantage, well then you have to bring technology in the systems to bear to do so. So they're asking the West for any one of these three. Thank you, they're saying to the West, for the British Challenger,²⁰ the German Leopard 2,²¹ and my favourite, the Abrams tank,²² (because that's what we use).

But actually the most important tank is the German Leopard 2. Now, the Germans have only offered, I think, 14 of these to go to Ukraine. This relatively small number will make not much difference, but, most importantly, it has allowed other countries that use the German Leopard 2 to forward it into the conflict. In arms procurement, the seller has a significant say over where the weapon is used, because they won't supply spare parts or systems. The Germans, up until now, have been telling countries like Poland who operate the Leopard 2, "no, we won't agree to you forwarding it into Ukraine," again on the assumption that this would lead to a level of escalation that potentially would cause the Russians to retaliate. But I think at the heart of it is that echo of history: Olaf Schultz and the population of Germany do not want to see

masses of German tanks advancing across the plains of Europe again. And I can understand exactly why they would feel that way. In this case I think they've relented, but with some discomfort.

Those Western tanks have all sorts of embedded technology. They have a laminated layers of armour that are designed to more efficiently dissipate penetrating projectiles. They have very advanced night-fighting capabilities based on thermal images. They have advanced ballistic computers that allow them to shoot on the move with very high levels of accuracy. And, increasingly, they include countermeasures and systems that will stop an incoming missile by firing out a blast of molten metal. So they very significantly overmatch the Russian capability.

Conclusion

In conclusion, I think, sadly, this war has a long way to run. We're entering a very dangerous period. We in the West have to maintain our support, that the Ukrainian people, population and military have demonstrated their resilience and resolve. We need to maintain ours. This period of Russian mobilisation is yet to be tested. I think many thousands of young Russians are going to be killed in this next phase as they push these poorly trained conscripts in human-wave attacks. We've seen them dig trenches that look exactly like the trenches that were in Western Europe in World War II. And the danger for the people of Ukraine is not necessarily the Russians, it's us with our ongoing confidence and resolve. So

²⁰ https://en.wikipedia.org/wiki/Challenger_2

²¹ https://en.wikipedia.org/wiki/Leopard_2

²² https://en.wikipedia.org/wiki/M1_Abrams

with that, I think I'll leave some time for questions and discussion on many of those elements.

Commentary and discussion

Andrew Condon: My name is Andrew Condon. I'm an Industry Professor at ACU. Can I begin first by acknowledging the Royal Society of New South Wales for taking on this subject? As confronting as it is, it's important that we have this conversation and that we're informed, and that we inquire, and that, being informed and inquiring, speaks to the mantra of the Society itself. I'm just going to put a few more questions to Gus, just to draw out a few more points. He's covered a lot already. I think there are a couple of things we can come back to. And then I will open it up to questions from the floor.

In the spirit of full transparency. I have known Gus for a long time. We joined the Army on the same day. Our military paths crossed many times. In 2004 on the tarmac in Baghdad, as I arrived on a C130 Hercules to start a six-month tour, I was greeted by Gus. We said hello, he quickly shook my hand, and then got on the plane to leave after his six months.

I value Gus's contribution here and in other forums because he's a practitioner in this space, a space that is often occupied by what I broadly call the commentariat. And we often don't actually hear from the practitioner. We'll hear from people who come out of the journalist space, the academic space, industry space, political space. But very rarely do we hear such an articulate practitioner. So I think we've been quite privileged here in what we've heard. Gus has covered a lot in a very short time. I just

want to dwell quickly on why it's important that we cover this subject.

We live in a global world where we're part of the global village. We have a war in Europe, or certainly that's what the Europeans call it: it depends who you talk to over there, but they'll tell you Europe is at war. We need to really deal with that and what the implications are for us here as a member of the global village.

Gus, if I can go to you now. You talked early about how we're entering the fourth phase, the counter-offensive phase. And you said it was the most dangerous. Can you just take us through why you think it's the most dangerous, what the risks are, and perhaps some of the things that we should be keeping an eye out on?

Gus McLachlan: Yes, thanks, Andrew. The Russians have used the winter — and, interestingly, the Russians have a term, they call it General Winter. General Winter has saved them a number of times. General Winter stopped Napoleon's advance, stopped Hitler's advance, and the Russians feel that the winter is their friend. In this particular case, the Ukrainians are as adept at the winter as the Russians are, and in fact have been equipped with much better cold-weather equipment and technology. They've come through the winter better than their Russian adversaries. But the Russians have used that period to dig very highly developed trenches and defensive systems. Now, history shows that things like the Maginot Line, which have been very highly developed systems, are far from impervious. But they do make the calculus for the Ukrainians much harder.

So breaking through a trench system — you know, finding a way through that defensive work — and then penetrating deep to liberate more territory is much

harder than it would be if those trenches were not there. So significant defensive works. The other thing is the simple reality of 200,000 Russian conscripts that are refreshing. Over the course of the first year, it's highly likely the Russians have had over 45,000 casualties.

Just think about that. We had 41 young men killed in Afghanistan. As a leader I buried three of those boys, standing next to their mum and dad, and it was heart wrenching. 45,000 young Russians have been killed. Interestingly, Putin rejected the first Ukrainian offer to repatriate bodies. Why did he do that? He didn't want the Russian population to know how many of their young men had been killed. So there are 200,000 Russian recruits, and, whether we like it or not, mass matters. We're going to see them enter the fray.

And I am still concerned about the Western approach: giving the Ukrainians just enough to be more successful than the Russians. I understand why that is the case. There's a great fear of escalation to nuclear weapons. We haven't talked much about that tonight, so I understand that fear, but I think the reality is we need to enable them to be successful as quickly as we can if we want war to be over.

Andrew Condon: You said dangerous from the point of view that Ukrainians are going to have to be much bolder in terms of going on an offensive, because potentially time is running out, and there is a big difference between defence and offence. Tell us about the challenges around the offence, particularly when they've now collected, through the generosity of other nations, such a diverse group of offensive weapons.

Gus McLachlan: In a perfect world, you would never have three different countries'

tanks operating in your military, three different spare parts systems, three different training methodologies and supply chains. They are relatively similar, those systems, but it's far from ideal. I think the Ukrainians will identify a brigade that deals with nothing but American systems and technologies. They might have another brigade that deals exclusively with German technology. In the fullness of time as they professionalize in the years ahead, they will remove a lot of this equipment and pick one particular way to go ahead. And that's why I actually favour the Leopard from Germany. 3000 Leopards have been produced. It's the most widely used tank by European nations. That's the one that is ultimately most likely to be the system that they would adopt.

Offence is harder for a range of reasons. In defence, you can largely be stationary, controlling anything — kids, dogs, people: easy when they sit still. In offence, you have to move and you have to pick up and move. And generally your opposition's trying to do things to harm you. So coordinating an advancing army is much harder. Keeping logistics up to it.

Andrew was a logistics officer, and I was a tank officer. I broke them, and he fixed them, and that's much harder as you know — keeping the fuel up to an advancing army. So I think the Ukrainians are actually professionally capable of all that. Noting that you don't mention this: the Russians have performed very, very poorly. They're a third-rate army. You've just got to be better than third-rate. And the Ukrainians are significantly better than third-rate. So I'm optimistic, but it will be bloody difficult and grinding.

Andrew generously describe me as a practitioner. What I don't want to do is

have you all understand and live what it's been like sitting under an artillery barrage for 24 hours. I have not done that. These Ukrainian soldiers at the moment are sitting under a 24-hour barrage of Russian artillery fire. If they move or put their head above a parapet, huge chunks of metal are flying around the battlefield. And so picking yourself up, moving forward through all that is an incredibly demanding thing to ask soldiers to do. So for all those reasons I am very apprehensive about what's still to come.

Andrew Condon: So big, big risks there for the Ukrainians. Clearly leadership is going to play a big factor. And you talked a little bit about leadership. There are some big leaders in this game: Putin, who brought this whole thing on, Zelensky, who has been able to hold off the Russians by keeping the nation together. Then Joe Biden, the European leaders, and Xi Jinping. There are a lot of people playing in this space, even though the conflict is limited to Ukraine. The point I'm keen to get you to focus on is the real impact that Zelensky is having potentially at the true level. Can you take us through what we understand and know about the value of leadership and its effect on morale, as essentially as a force multiplier?

Gus McLachlan: Yes, great question. In military thinking, we say the morale is to the physical as three is to one.²³ So leadership and morale are three times as important as a new weapon system, or additional troops. And I think that's been clear: Zelensky's leadership, cascading through a very, very professional senior military leadership, has been significant. And if the soldiers believe their leaders are authentic, real, willing to share their risks and are very good at their

job, then they'll generally follow orders and keep doing what they need to do.

On the Russian side, the Russian soldiers know their leadership don't care about them. There are often troops behind them, willing to shoot them in the back if they don't advance. And so that morale is to physical plays opposite for them. My only hope for what might happen is that the Russian military morale might collapse as it did in 1917, when the Russian military ultimately rejected Czarist leadership and brought on the Russian Revolution. I don't anticipate that it'll be quite as dramatic as that, but it is entirely possible that whole battalions of Russian troops will simply refuse to fight. And that that might percolate quite quickly back to Russia. That's probably the only thing in my mind that could lead to them turning on Putin.

We haven't talked about the Ukrainian military leadership. It's been quite extraordinary. I'll give you one anecdote. You probably haven't followed it as closely as I have, but there was a period there where Zelensky was saying publicly in Ukraine and through all this media commentary that he does and all these meetings with foreign leaders, "I have told my troops that they are to focus on the south. The Russian troops that have crossed the Dnieper River must be removed at all costs. I have told my troops to do that." Now I remember thinking at the time, "It's a bit unusual that he's being that explicit because that gives the Russians an indication of his intent." And we actually saw Russian troops moving to reinforce that enclave. That was part of a strategic-level deception. The counterstrike occurred hundreds of kilometres away in the East.

²³ This is often attributed to Napoleon, in 1808. [Ed.]

So they have a level of cooperation between the things the president's saying and what the military leadership are asking him to help with around deception, that is incredibly heartening to see. And, again, we are just not seeing that, on the other side, Putin is just whipping them, telling them they can't withdraw — all of those things which Hitler did in World War II that made the ability for his generals to do their job incredibly difficult. So, again, I think we've got a 21st-century modern authentic leader willing to share the risks and be with his soldiers and be identified. And we've got another fellow who sits at a 30-metre-long table with people at the other end in case he gets a dose of COVID.

Andrew Condon: Let me take you to the subject of drones. You've spoken about that. I'm interested in what we are learning about drones and potentially what the crossover is into other domains. I'll pick agriculture as an example, but there is scope for many others as well, in terms of innovation, the whole learning cycle and adaptation cycle. What are the opportunities you're seeing particularly with drones, or anything else that we're seeing in Ukraine?

Gus McLachlan: Huge question. And I'm conscious that I'm in the presence of the chair of the Autonomous Systems CRC, who knows far more about this than me. First, I've used the drone examples shown. And in fact, one is a commercial drone with a 3D-printed release mechanism to drop a hand grenade down somebody's shorts while they're cleaning their teeth. But we also saw drones being used in the attack on the "Moskva," the Russian cruiser that was sunk in the Black Sea on April 14, 2022. Drones buzzed that vessel for two or three days, bringing the crew to a level of fatigue and

belief that these were just irritating. And then, in the screening effect provided by the drones, they flew some anti-ship missiles and sank a Russian cruiser — an extraordinary achievement.

We've also seen Russian surface combatants sunk by sea-based drones. These are large model boats, loaded with explosive, that can find their way through defensive works and ram themselves into the hull of a ship. And we are just as likely to see them emerge soon in the ground domain in terms of their ability to have sleeper vehicles that can pop up and drive themselves into the side of a tank. Horrific, scary stuff.

For a country like ours, we've got to decide what we can build strategically in this country. We've chosen to have a national ship-building endeavour, incredibly expensive and difficult. And, it appears we're going to make a go of that. I'm much more interested to hear how Mr. Marles describes our ability to make nuclear submarines in Adelaide.

But we can do things like drones. The fourth industrial revolution has allowed us to skip the hundred years of iron forges and welding that was needed for ships. But we can produce and we do produce some of the best autonomous systems in the world. Now what we've got to do is back those organizations, help them collaborate and put in private equity and buy enough from our military. We will then see crossover into other industries.

Andrew and I volunteered last year in the wheat harvest when the wheat farmers couldn't get labour. The two of us went out to help harvest. And we saw immediate things. These farmers are using amazing digital systems on their tractors that can do AI-based weed spraying, but they can't

always get connectivity with the web. A simple drone, such as the military takes for granted, circling overhead, could change the nature of the connectivity of our agricultural industry, for example. Dangerous, boring and dirty. You know, a drone can do many things better than humans. And we all know there are many applications like that. I think this is one of the things we can be globally competitive in relatively quickly.

Questions

Andrew Condon: I'll now go to the audience for any questions. The first question is around the use of mathematical modelling, to essentially understand the risks of nuclear war. Gus, have you got any thoughts on that?

Gus McLachlan: I thought I might defer to the former head of Army simulation and modelling, who's sitting on my right, and let Andrew comment. The answer is: yes, sophisticated models are used. Recently we've seen in my world a number of publications about models that have simulated the China-Taiwan scenario. I've got no doubt that those same models are being run by NATO. Effectively what they're doing is putting in as many of the variables as they can, and ultimately working out potential casualties, et cetera, in modern digital command-and-control systems.

We also, at a much less sophisticated level, try to build what we call a war game into that process. So there is some intellectual rigour around the analysis. Generally where technology's going more broadly: we match the tool to the experience and judgment. And together we think that's going to make better decisions. What'll be interesting in the future is we'll have the spies of respective countries with one of their objectives to get hold of the modelling tool that their

adversary is using, to understand the decision making. I think this is the world that we're entering. But, Andrew, you genuinely are an army expert.

I've studied military operations research, and, yes, the modelling and the sophistication of that is significant, but it's highly classified. So we common people are not likely to see that. But, clearly, decision makers would have access to what the current status of that is. The reason it's classified is specifications like the armour thickness and the accuracy levels of weapon systems. All that is built into the code. There are effectively game-based systems, which replicate some of that, but not to the level of granularity. So the answer to your question is, yes, they do use mathematical modelling. And the good news is they're often worst-case predictions, which I think is important. I'd much rather know the worst possible outcome and make my decision on that basis.

Andrew Condon: Gus mentioned we're at phase four, and the next question is: what are the subsequent phases and what is likely to be the end phase, or one of the possible end phases?

Gus McLachlan: This is the question that all of us are turning our minds to, and there's Zelensky's preferred end, and then there's the other end — I might call it the Macron end. I might be being unfair to the French president, but I'm just going to put him in two camps. Zelensky is working incredibly hard to maintain his narrative and the drumbeat that Ukraine can win and evict Russia from all of its territory. I don't necessarily disagree with him, I just wonder what the cost to his country and his people will be. But at the moment, it appears that the people of Ukraine are supporting his

determination in that regard. And in fact, he might be politically vulnerable if he took a different stance. So that's one possible outcome. Sadly, we're still talking about this at Christmas 2024, because that's a grind that is not over quickly.

I think there is another group of people who are trying to work out what we call an off-ramp. How do you give Putin and Zelensky a solution to this problem that allows some level of stepping down, maintaining face and not putting the Europeans at risk of subsequent Russian activity where they might be emboldened to continue in five or ten years' time? I think that group would probably say that it is unlikely the pre-2014 borders will be resumed, which means ceding the Crimea and a large chunk of the Donbas to an invading, neighbouring army. We can all feel the emotional discomfort with forcing that on the Ukrainian people. Had the Ukrainians not been so successful with the counterattack that that recently occurred, I think would be further down that discussion than perhaps we are. If we were in the grinding, attritional fire-and-movement phase still, and we hadn't seen the Ukrainian success that we saw late in their summer, then I think we would be further down this discussion.

So Zelensky and his army have bought themselves further time and opportunity for an all-out victory. I'm not going to put weight on which I think is more likely, but I think for now particularly the Americans are still backing Zelensky and the Ukrainians' opportunity to have a total victory. I think perhaps the president of France and the chancellor of Germany might have a slightly different view.

Andrew Condon: The other factor is the Putin leadership. It's yet to be confirmed, but the Twitter world is talking today that the *Wall Street Journal* is reporting that Putin's terminally ill with cancer.²⁴ If he was no longer the leader, we don't know where that would go, whether we'd get someone more moderate or worse.

Gus McLachlan: 75% of the Russian population still supports the war, although information is controlled and I don't think the Russians know all the things that are occurring. So unless Putin does fall over, I don't see a palace putsch to get rid him. I think it's unfortunately going to have to be done the hard way.

Andrew Condon: The next question is: given that Russia is a nuclear power, could it ever be satisfied to lose a war on its doorstep? The second part of the question was on Russian because they can still mobilise so many more people. How does that factor play into this calculation?

Gus McLachlan: I'll take the second part first. I think full mobilisation appears to be one of Putin's Achilles heels: otherwise he would've done it by now. This partial mobilisation, I think, came at some cost. I think the reality for him is that popular support would evaporate. But full mobilisation is a tool available to him still and would be a significant game changer. That's the simple reality. The Russians still have acres and acres of old equipment — some are very old T34 tanks from World War II — that if Putin fielded a brutal attrition army with a mobilised force, and he put enough of that into the field, it would have an effect. And, again, this comes partly to my fear for that

²⁴ At the Aspen Security Conference in July 2022, the director of the CIA, William Burns, publicly announced that there's no evidence that Putin is sick [Ed.]

Russia under Putin is still a very dangerous country to fight, but I do think there's something that he understands about his own population that may be a step too far.

The nuclear question is a huge question. There are whole theories around deterrence and its value. And there are certainly many Russian commentators who are potentially on the right of Putin — scary thought — who are saying, “well, we're a nuclear capable nation. Why wouldn't we use it rather than be defeated?” I know those voices are out there because we are seeing some of it replayed back to us from their media and other commentators. I'm doing some work with Joe Hockey, our former treasurer. Joe's publicly said he and some of the Washington elites are thinking that there's still a 30% chance that nuclear weapons will be used in Ukraine.

I disagree with him. I think it's probably closer to 5%, but even the thought of a 5% chance of nuclear war on the continent of Europe is still an extraordinary risk. And that really explains the very careful measured American response, particularly about just how much support they're giving the Ukrainians. Joe Biden was asked, why are they not getting F16s? The Americans are trying to be just inside that threshold of nuclear retaliation, in my view. I think they're doing some other things. They've put masses of aircraft into a bunch of European bases. And I think the message to Putin is: “we won't retaliate with nuclear weapons, but we'll retaliate with enormous conventional force.” Things like sinking the Baltic Sea fleet, et cetera. So they're trying to increase the stakes against Putin using nuclear weapons. A kind of a layer removed from giving the F16s straight to the Ukrainians. But there's a whole theory of deterrence

research that is going into this. And, God forbid, even the optimist in me says we're only 5% likely to see a nuclear exchange on the continent of Europe.

Andrew Condon: I can't resist the comment as a logistician in terms of the mobilisation question. That is a massive logistic challenge. And so far the Russians haven't really demonstrated world's best practice in that space. I suspect that's one of the other hurdles that Putin has now realized: that actually it's a really tough gig to mobilise, given what appears to have been the endemic corruption and lack of systems that have been functioning, for them to be able to do that. So even when he wants to do it, it's going to be really hard for them.

Gus McLachlan: Yes, in the “special military operation” phase: you know most of those conscripts came from ethnic minorities, socially disadvantaged groups, and so are largely invisible from the Russian elite. I think full mobilisation brings that, you know, into the families of Moscow — a whole different kettle of fish.

Andrew Condon: So I think got time for one last question.

Roy MacLeod: Thank you. Something old and something new. I speak as a historian: Australia has a lot of bearing on this. It was the younger WL Bragg who developed the sound-ranging techniques that took out the German artillery that permitted the advance in the Hindenburg line that helped contribute to the end of the First World War. He anticipated a lot of the current technology in sound-ranging and flash-spotting. Secondly, I wanted you to ask you quickly, in relation to the choices, the alternatives that are going to be part of the defence review next month. What do you

see as the particular lessons coming to our Defence Department, our defence establishment, from Ukraine? And, related to that, what would be your choices, rising above the Army to some extent, not dealing with submarines or with F35s or B21s? Where do you see the priorities?

Gus McLachlan: Well, we're going to need to book the facility for another talk, because it's a huge question. It is important. And I can tell you if you want to read some fantastic material, Chatham House²⁵ and *Russi* have published a very good analysis of the lessons learned from the first year of the conflict, and some outstanding technical analysis of the different capabilities of the Western versus the Russian systems. One of the things they observed: they were shocked at how many Western chips were in the Russian technology. Quite shocked at how reliant on Western chips they were. So for some reading separately, I can shoot this to the Society so we can put it in the *Journal*. We definitely need to be studying the lessons from this for our military.

We've got a defence strategic review that the new government has commissioned.²⁶ I think Mr. Marles already has the results of that review on his desk and they're working through it. What does it mean? Do we modernize our armoured vehicles in the Army with this in mind? Or are they now a liability and we need more long-range missiles, drones and potentially nuclear submarines — although I think I'll be long retired from this discussion before we see any of those. So a huge topic. The other associated question, into Andrew's area of logistics: what should our national pri-

orities be? At the moment, Mr. Marles has announced that we are contributing some artillery ammunition: we will provide the explosive propellant that will be shipped to France to be packed into a projectile to given to the Ukraine.

We can't make a complete artillery projectile in this country. We can't make a missile, et cetera, et cetera. So the days of being able to outsource to this global supply chain, if we wanted more Javelins tomorrow — by the way, they are firing Australia's entire stock holding of Javelins every two days in the war — we can put our orders in all we like, but we won't see a missile cross our ports for two to five years. So, these are all questions that we've got to be asking, and that's why Andrew and I are grateful for the opportunity to talk about this because I've spent my military career looking to preserve Australian democracy. Democracy works if people are informed and we are making the right decisions and asking our politicians the right questions. These are all the right questions to ask them.

Christina Slade: I've got a very daunting task of thanking our two speakers tonight. Towards the second half of last year, we in the program committee were thinking about what the issues for 2023 were going to be. Even then we knew power might be one, but the one that we thought about and I started to worry about was technology and what we are learning from the war in Ukraine. that was a big question. We knew that there were these issues, but we didn't know who we could get to talk about it. It's very difficult to find the right person to talk.

²⁵ <https://www.chathamhouse.org/regions/russia-and- Eurasia/ukraine>

²⁶ <https://www.defence.gov.au/about/reviews-inquiries/defence-strategic-review>

As it happened, I'd been introduced to Major General (rtd) Gus McLachlan, in early 2021, or maybe 2020. And I managed to persuade him last year to become a Fellow of the Royal Society. So we are extremely lucky, and I think he's probably absolutely unique among Fellows of the Royal Society in being a highly decorated, combat-hardened senior officer. So we had the perfect person. Looking back over what Gus had done, there were a series of articles quoting him, where he was leading exercises, Exercise Chong Yu, where he was quoted saying this included a static display of the LAND 400 P2 Boxer CRV, the Eurocopter Tiger armed reconnaissance helicopter, protected mobility, light Hawkei vehicle, and unmanned aerial systems. He really knows this work and he's led it all the time.

He, in fact, agreed to become the chair of an advisory group for a new centre focussed on cybersecurity and artificial intelligence at Charles Sturt University. And, as we were setting that up and recruiting a really excellent head, I learnt that Gus was able to draw on a really wide range of people from very different areas: people from the federal police, from the start-up communities, and find something, and managed to get an answer and think it through. That was really, really impressive for me. I think what you said, Andrew, was really interesting: that we've chosen a practitioner and, I think, incredibly luckily, we've got someone who, as it turns out, is not just a practitioner: he's a journalist — there he is on "The Drum" tonight — but obviously also a commentator and a thinker and an academic around these areas. And I must say

that my own feeling after tonight was that if our military is at this level of expertise, but also has the ability to think through the strategic historical context and also to bring that very sharp ethical view to bear, then we are pretty lucky. So I do want to thank you both very much indeed. I think we're very excited. We hope that we'll get something in the *Journal* to be based on that and look at us on YouTube.

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