New England Journal of Public Policy

Volume 36
Issue 1 *The Changing Character of War and Peacemaking*

Article 4

6-16-2024

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John, Lord Alderdice
Harris Manchester College, University of Oxford, john.alderdice@hmc.ox.ac.uk

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Harris Manchester College, University of Oxford; Changing Character of War Centre, Pembroke College, University of Oxford; Global Humanity for Peace Institute, University of Wales Trinity Saint David; House of Lords Select Committee on International Relations and Defence; The Concord Foundation

Abstract

Wars are often marked by technological advances and while the front line in the confrontation in the Russia-Ukraine War is between the two countries concerned, many other countries are also involved in bringing a range of weapons to bear. Some, such as drones and satellite communications, are not entirely new, but are playing a greater role than before. They are also being combined with more definitively new technologies such as artificial intelligence. However, the older ways of warfare are still center stage. Not only has there been a return of war in Europe between major powers, but even the trench and tank warfare that some had thought were consigned to military history have returned with brutal consequences. The faltering of the post-war international structures that had given stability and a foundation for international law, has also undermined confidence in the peacebuilding processes based on them and so the author proposes a new set of foundational principles.

John, Lord Alderdice is a Senior Research Fellow at Harris Manchester College, Oxford, Executive Chairman of the Changing Character of War Centre, and an Honorary Fellow at Pembroke College Oxford. He directs the Conference on the Resolution of Intractable Conflict, is a professor of practice in the Global Humanity for Peace Institute at the University of Wales Trinity Saint David, and since 1996 he has been an active Liberal Democrat member of the House of Lords where he is currently a member of the House of Lords Select Committee on International Relations and Defence. He is the Founding Chairman of The Concord Foundation and an honorary fellow of the Royal College of Psychiatrists.

Few pressures concentrate the inventive mind of a community more than the threat of death or defeat, and so major wars often result in significant technological advances as those who are prosecuting the conflict seek to apply every possible improvement in scientific understanding to achieve military advantage.

The First World War produced important innovations in existing weapons such as grenades, machine guns, and artillery, along with new weapons in the familiar war spaces on land and at sea, including tanks and poison gas on land and submarines at sea, but also extending into the air with the use of zeppelin airships and warplanes.

The Second World War saw the use of medical advances, with vaccines, penicillin, and blood plasma transfusions playing a part in the war; low level technology that had important contributions, including synthetic rubber, superglue, and duct tape; but more obviously and directly the creation of the jeep, the invention of radar, and the building of electronic computers, especially for code-breaking; and further major advances in tanks, naval vessels, and airplanes. Most dramatic and earth-shattering was the creation and detonation by the US of two atomic bombs at Hiroshima and Nagasaki in Japan.

Throughout the Cold War, the development of traditional weapons, war vehicles, and communications technology continued, and the USSR responded to each advance in nuclear weapons by the US with a development of their own, and vice versa. While the Soviets tended to concentrate on more powerful weapons, the Americans also improved the sophistication and accuracy of their systems. Both sides massively expanded their numbers so that, while some military strategists maintained that limited or theater nuclear warfare was possible, the stockpiles were such that by the 1980s there was the capacity for, and risk of, global 'mutually assured destruction' many times over.[1]

With the end of the Cold War there seemed to be a thawing of relationships and the negotiations on Strategic Arms Reduction Treaties (START) began to have an effect on both the numbers and types of nuclear weapons. The two major powers also avoided direct confrontation by operating with or through proxies who were often using terrorism as their tactic. The anxiety levels in civil society diminished and the issue became less of a preoccupation. By the late 1980s Mueller, Mandelbaum, and others were arguing that major war was now obsolete, and some even said that inter-state war was no longer possible.[2] Through the 1990s authors such as John Keegan and Mary Kaldor wrote that Clausewitz-type wars were a thing of the past and in the future war would be waged by non-state actors, guerrillas, and terrorists instead of states.[3] The attacks on the United States on September 11, 2001 might have seemed to confirm this analysis but, as we shall see, the reality was much more complex and less reassuring.

In the meantime, and since then, the pace of technological change has been so rapid as to be unsteadying. The military-industrial-complexes in major countries were working energetically on a range of scientific advances and their technological applications in a wide range of domains—computer power, communications technology, satellite exploitation, artificial intelligence (AI), and biological genetic modifications. In addition to operating on land, sea, and air, space and the whole new cyber world were added to the contexts where war can be conducted. There was a great deal of excitement as well as anxiety about how these new capacities might be exploited in warfare, but it is only in the context of a 'hot war' that we can be clear about which of these technological developments has the most impact.

Inter-state War Returns

Despite the new capacities for surveillance that were making ever more global information available to both intelligence agencies and private individuals, in the months prior to the Russian attempt to extend its invasion and occupation of Ukraine in February 2022, many leading politicians found it difficult to contemplate the possibility of a return to a major war in Europe. Though there was substantial data about the assemblage of military forces around the borders of Ukraine, and clear, detailed, threatening statements were being issued, sometimes at great length, by President Putin and his entourage, with few exceptions beyond the US, Poland, and the UK, most NATO members were not really expecting that the Russian president, Mr. Putin, would actually embark on what he still insists on describing as a 'special military operation.' The failure was not of information gathering, but of the mature capacity to use the available intelligence and face the reality of humanity's aggressive and destructive tendencies.

The Russian president clearly expected that Ukraine would fall into his hands relatively easily and the reasons why it did not will be a matter of study for many years, but he is absolutely committed to proceeding with his invasion and war because it is part of a wider and deeper determination to avenge what he sees as the disastrous humiliation of the collapse of the Soviet Union. That is why we must assume that if the result of the Russia-Ukraine War is that he is seen to be successful, at least in his own terms, he will be emboldened either by that victory over Ukraine, or through the war spreading elsewhere, and he will not stop there. While he has put the Russian economy on a permanent war footing, the West remains unprepared both psychologically and militarily for full-scale war. This could be catastrophic not only for some of the countries concerned, but for liberal democracy globally.

Ukraine is not the only front in this war. The Middle East has its own internal and regional dynamics, but the meeting that President Putin hosted with Hamas and Iranian leaders in Moscow in October 2023, which he described as representing the Axis of Resistance, followed up with further meetings, including with Houthi rebel leaders in January 2024, shows how his ambitions go well beyond re-establishing the old borders of the USSR, though not of course beyond the boundaries of its influence and involvement, which were global. However, this emerging geo-political re-alignment goes further than merely a return to the status quo ante. The appearance of an increasingly powerful and assertive China under President Xi Jinping, who intends to bring Taiwan back into the arms of the Chinese state and of the Chinese Communist Party and has been extending his country's influence well beyond any past extent, also raises profound anxieties.

These political developments are further reflected in the sharing of military technology. For example, Iran has been providing Shahed drones to Russia for use in Ukraine as well as drones and missiles to the Houthis in Yemen, and China and North Korea have not only been providing military hardware, but along with many other countries in the region, in cooperation with most of the Global South, have been frustrating Western efforts to maintain economic sanctions on Russia. The profoundly serious conflicts in Africa, whether in Libya, the even more destructive war in Sudan, or elsewhere, are also being caught up into this new global division.

The New Adds to, but Does Not Replace, the Old

Prior to this spiral into chaos, it had been expected that if new wars did arise involving sophisticated and developed countries, they would be very different from the wars of the past. It was thought, for example, that much of their impact would be through cyber operations. There have certainly been significant cyber operations, not least using social media to create

disinformation, fracturing, and confusion, but to date they seem to have been less successful in striking key elements of critical infrastructure. This is not so much because there have been no attacks on critical infrastructure but is a result of the better preparedness that has frustrated the attacks that have taken place and protected against them. However, much of the military engagement in Ukraine has been anything but modern. Indeed it is horribly reminiscent of the trench warfare and attritional artillery bombardment of 1914–1918 or the major tank maneuvers of 1939–1945. The operations of Israel in its latest war in Gaza have produced a similar outcome to the carpet-bombing of the 1930s and 1940s, and this despite such bombing of cities, towns, villages, or other areas containing a concentration of protected civilians having been considered a war crime since 1977 through Article 51 of Protocol I of the Geneva Conventions.

We have not moved to wholly new wars, in the sense of abandoning the old ways. The control of territory, whether protecting one's own territory or seeking to seize control of the territory of the enemy, and destruction of the enemy, both people and power structures, remain central to the struggles at the heart of today's wars. The major vulnerability of the Ukrainians is a shortage of weapons and ammunition, exacerbated by the relatively low stocks and remarkably feeble replacement capacity of their European allies. All of this is not redolent of 'new wars' but of very traditional military logistical challenges.

Drones

That being said, there are new technologies, and they are playing a major role. Perhaps the prominence of drones, or so-called 'uncrewed systems,' is one of the most dramatic developments. The use of 'uncrewed systems' is not itself new. Aerial target drones and boats controlled at a distance were used during World War I to deliver explosives, but the recent rapid advance of cheap, effective technology has completely changed their use.[4] While the governments of the US, UK, France, and others worked on developing uncrewed and autonomous systems conceived of as unmanned airplanes which, like their crewed versions, are large, sophisticated, and thus very expensive, to date the most effective use of drones has been through the technical and tactical modification of small, inexpensive civil drones. The Ukrainians have been particularly creative in the development and use of this technology.

Drones had previously made a significant impact in the conflict in Libya. While initially the arrival of Chinese-made Wing Loong drones in 2016 improved the capabilities of General Haftar's self-styled Libyan National Army (LNA), when Türkiye intervened in 2019 with a supply of Bayraktar TB2 drones in support of the UN-recognized Government of National Accord (GNA), it had a dramatic effect and the UN special representative to Libya, Ghassan Salamé, described it, at that time (May 2020) as "the largest drone war theatre in the world."[5]

However, it is in the war in Ukraine that the use of drones has expanded exponentially. James Cartlidge MP, the UK Minister for Defence Procurement, described it as "a very visible representation of a 'new way of war,' one characterized by innovation, the proliferation of technology, digitization of the battlefield and the need to rapidly develop capability for the tempo of operations."[6]

There are different types of drones with various capabilities that are being used. Small inexpensive drones have been used by Ukraine for reconnaissance missions, providing both intelligence and propaganda material, but at least as importantly they can be used in combination with artillery to produce much faster and more accurate targeting on the front line. So, while both traditional and modern artillery have been used in the war, these cheap drones have massively increased the speed and accuracy with which their operators can target and take out enemy ground

forces. Of course, what is true for one side is quickly true for the other side too and so it is now more difficult for soldiers from either side to find hiding places on the battlefield. The only way either military can function and survive is to operate as small, highly mobile units that are constantly aware that when they fire their weapons they must immediately relocate and conceal themselves to avoid being targets.

Ukraine has also used low-cost first-person view (FPV) drones, which are constructed from cheap commercial products that are modified to carry small explosive devices, and these have proved to be effective anti-tank weapons. Tanks are traditionally best reinforced with hard skins around the outside but are vulnerable 'up top' where there is less reinforcement, in order to keep the weight of the vehicle to a manageable level. If a drone with an explosive payload can fly overhead and drop a device on top of the vehicle it can be devastating.

As I have already noted, Iran has been providing Russia with long-range kamikaze Shahed drones that are relatively inexpensive, can fly long distances, and deliver a substantial payload. These drones can be manufactured and used in large quantities and NATO has no 'cheap' equivalent weapon. Not only is this inequality in drone costs proving to be significant in Ukraine, it is even more dramatically for the Yemeni Houthis in their attacks on Western shipping in the Red Sea. They are using two-thousand-dollar drones and the US is trying to take out the Houthi drones with two-million-dollar missiles. This is not an economically viable strategy.

One of the most dramatically successful of Ukraine's drone tactics has come with the use of maritime drones, which include both surface and underwater uncrewed weapons. They have been able to target Russian ships and make much of the Black Sea a 'no-go' zone for Russia and a protected space for exporting Ukrainian products. The Houthis are also now using maritime drones, with limited success to date, but that may simply be a matter of time and development.

As the Russia-Ukraine War continues, and replacement ammunition has become a problem, the Ukrainians are being very inventive in their attacks. One method has been the use of a range of old Soviet-era Tupolev Tu-141/143 drones that were initially retired four decades ago by the Russians. They are around seven tons in weight and forty-seven feet long and they can carry a significant and very destructive explosive payload. They have been effective in deep strikes by Ukraine into Russian territory, inflicting significant damage on oil facilities. Even more ingeniously they have found ways of converting light civil aircraft such as the Cessna into exploding drones. These can be packed with explosives and with their low radar signature they can be flown slowly, at low altitude and erratically, under robotic control, hundreds of miles into Russia and detonated upon reaching the target. Perhaps surprisingly, these have proved quite effective. Because in the past the Soviet Union was surrounded by 'friendly' buffer states, the Russian air defenses were designed to deal with the more sophisticated, long-range, high-tech US missile systems. They have found it more difficult to adapt to creative Ukrainian low-tech inventions.

It would however be superficial and misleading to characterize these less expensive drones as an answer to the conduct of war, even during the current conflict. Every significant innovation by one side is quickly examined and responded to with a technical advance by the other side. Ukrainian allies are working on newer technologies, for example Estonia and the UK recently announced collaboration on a long-range drone system designed for the Russia/Ukraine theater, but Russia and its allies are similarly seeking out advances.

Hybrid War

This constant ratcheting up of drone capacities is still only part of the story for they are part of a hybrid approach that is itself in a constant process of revision and development, the principles of which are well-described by Brian Arthur. As he points out, not only do technologies adapt by changes to their own individual elements—for example, being miniaturized and becoming more powerful—but they also combine with each other and bring about novel structures and capacities. Combining existing technologies can result in new technologies that yield new and sometimes unexpected effects.[7]

So, it is possible to use drones for surveillance and intelligence gathering, which is then fed back to the gunners manning the artillery and missile launchers through the use of rapid communications, especially the Starlink satellite system provided by Elon Musk and SpaceX. Starlink brought high-speed internet access to almost anywhere on the globe. It is then a relatively short step, at least in principle, to connect the intelligence-gathering function of the small drones to the attack weapons without the time delay required by a human operator. The next generation of drones will undoubtedly be enabled by artificial intelligence to operate increasingly autonomously and collaboratively. There have been reports that Israel has been using a previously undisclosed AI-powered database system called Lavender that is said to have identified 37,000 potential targets for attack based on their apparent links to Hamas.[8] Such AI programming takes out human judgment and speeds up the process of attack, but it was often this human element that saved us from accidental nuclear conflict during the Cold War when the technology misinterpreted what was happening and human hesitation in decision-making prevented catastrophic escalation.[9]

Not only does AI enormously increase the speed and targeting capacity of the military, but, because the cost of smaller drones is so low, various militaries are contemplating the production of huge numbers of them. In the UK, Chief of Defense Staff Admiral Sir Tony Radakin stated in February 2024 that the Army, Navy, and Royal Air Forces intend to procure 'hundreds of thousands more drones' and Ukraine announced that it intended to produce a million drones in 2024. AI will soon enable them to be operated in 'swarms' and defense against huge swarms of autonomous drone weapons will be much more difficult. These drones will not be obtained through the usual laborious, specific military planning and procurement processes that have bedeviled efficient provision of arms and machines. Instead, many of them will be obtained 'off the shelf' from civil supplies, which can then be adapted as required. The expensive and inefficient bureaucracy in which military procurement has become entrenched may be one of the many reasons why some of the most powerful states are no longer able to be successful in their military ventures. In recent decades, supposedly weaker conflict actors are regularly outpowering stronger actors. This is also because they are 'devoted actors' driven by faith in defending or advancing their nonnegotiable 'sacred values,' whether religious or secular.[10] As I have pointed out elsewhere, bringing together insights from large group psychology, neuroscience, epigenetics, and political science gives us some of the human answers to the success of these 'weaker actors' in terms of individual and large group functioning, but the inefficiencies of large democratic societies also plays a part.[11] It is striking how in Afghanistan and Iraq, but also in Gaza with Hamas and with the Houthi rebels in Yemen, much wealthier and more apparently powerful states—the US and its allies, Israel, and the Kingdom of Saudi Arabia—have been denied military victories, and an important element of these outcomes has been the creative adaptation of unsophisticated technologies. A striking example is the use of drones by the Houthis to close down critical global shipping lanes, send the price of oil soaring, and contribute to inflation in the West. The impact on the US presidential election on the

other side of the world is significant because despite being so far away and so much less well resourced, they are making the reelection of the incumbent, President Biden, more problematic.

Globalization and the Changing Character of War

The role of globalization in minimizing the significance of geographical distance has been much more complex than its early supporters imagined. The technological advances that resulted in such remarkable increases in the speed of communication and travel were seen by developed Western countries as opening up new markets, expanding liberal democracy, and making the world a more collaborative and safer place. They assumed that a more connected and more prosperous world would welcome Western culture and liberal politics. The actual result has been an empowerment of the Global South, which for years resented the colonial history and political hypocrisy of countries that proclaimed a commitment to democracy but only accepted election results that were in their favor. While Western countries trumpeted their commitment to human rights they often allied themselves with authoritarian and oppressive rulers if it was in their perceived interests. Free markets increased the wealth of developing countries, which could then afford to purchase and adopt the improved technology of warfare, but without adopting Western liberal values or political norms.

This disenchantment was exacerbated when the global pandemic struck and developed countries made remarkably little effort to share the benefits of COVID-19 vaccinations. Meantime, while China may have contributed to the spread of the pandemic in the first place, it made more effort to share its vaccines, even if they were not always of the highest quality. China also cooperates in development projects and provides loans to risky ventures, asking no awkward questions about human rights or environmental protections. It is true that when it comes to paying back loans, the glitter may fade, but nevertheless, what we are increasingly calling the 'Global South' identifies more with China, and even Russia, than with what we call 'the West.' The attractions of liberal democracy and freedom to trade have proved to be more modest than expected and the freedom to travel has vanished with increasing Western restrictions on immigration and asylum.

The democratizing of economic, political, and military power has also resulted in the spread of violent conflict and war, and a growing number of failed states, often a consequence of Western interventions. Writers such as Steven Pinker, who insisted that the world was becoming more peaceful, and Francis Fukuyama, who claimed that humanity had reached "the end-point of mankind's ideological evolution and the universalization of Western liberal democracy as the final form of human government," have been shown to have made shallow judgments not based on the reality of human nature.[12] The threat of war fought with nuclear weapons is back on the agenda in a profoundly threatening way, not just in the traditional theaters of conflict in Europe and the Middle East, but, in the longer term, between China and the West.[13]

New Challenges for Peacebuilding

A generation ago there was reason to believe that what was called 'the developing world' looked to the social, economic, political, and cultural life of Europe and North America as an ambition and even a source of envy, however things have changed. It is clear that not everyone in the West benefits from its wealth, and its systems of welfare and healthcare are faltering. The rule of law, which previously gave confidence about fairness and integrity, now appears to many people to make unreasonable demands for acute sensitivity to the wishes of minority religious and other

groups, while dismissing and even delegitimizing the views of substantial elements of the community, and too many leading figures in countries that claimed to promote fairness and integrity have demonstrably lacked either of them. Military might has resulted in almost constant interventions based on the selfish strategic and economic interests of Western powers, resulting in death, destruction, and failed states, rather than prosperous societies based on the values of liberal democracy. Almost everyone still wants the science, technology, and medicine that resulted from the Enlightenment, but people are much less sure about the rest of the package. Those who live in North America and Western Europe seem to lack confidence in their own systems and question whether the military interventions embarked on by their governments are worth the cost in blood and treasure, or that they bring positive results for anyone. Even development aid is being questioned, and in some cases radically reduced or re-directed.

This wish to withdraw from military engagement and the funding of development aid accompanied by a loss of confidence in liberal democracy, is mirrored by uncertainty and lack of direction among those who have previously been active in, and committed to, peacebuilding. When the journalist Matt Waldman, who is a senior advisor at both the European Institute of Peace and the United States Institute of Peace and a former special advisor to UN envoys, used the period of the global pandemic lockdown to conduct online interviews with some eighty-six experienced negotiators from the UN and other national and international agencies and NGOs, and asked them about their work, he found an almost universal sense that the old ways of peacemaking no longer worked but that it was not yet clear what might replace them.[14] The Conflict Management Initiative, now known as CMI – Martti Ahtisaari Peace Foundation, established by the former president of Finland and Nobel Peace Laureate, is one of the world's leading organizations in the field. In recent years they have found themselves running into new hurdles in their peacemaking work and began to realize that something had changed about the context. If the technology of making war had changed, it seemed the technology of making peace also needed to adapt to the new circumstances.[15]

The events on September 11, 2001 and the responses re-shaped the fields of conflict and peacebuilding and it was thought for a time that the twentieth century problems of conflicts between states were being replaced by a new security landscape where non-state actors and terrorism would be the main threats, and states with competing interests would collaborate within post-war international institutions on counterterrorism and stabilization efforts. But twenty years on, the deepening of the invasion of Ukraine in 2022 suggests that the conflict paradigm was returning to inter-state conflicts, leaving the key multilateral organizations, both intergovernmental and non-governmental, in a state of profound uncertainty.

Must We Fall Back or Can We Move Forward?

In his 2023 book, "The New Leviathans: Thoughts after Liberalism," the iconoclastic English philosopher, John Gray, sets out a challenging perspective that returns to a Hobbesian analysis of international relations. Instead of the belief that humankind, albeit in fits and starts, was moving inexorably toward a peaceful, rational, liberal, well-ordered, and prosperous future, he says that we are falling into a world dominated by authoritarianism, intolerant nationalisms, and unreason. He proposes that the relatively short period when the liberal trajectory seemed to be in the ascendent, should be regarded as, in historical terms, a passing blip, an aberration that is already dissolving away.[16]

He may be right, but in a previous article I have described an alternative perspective in which I agree that the old forms based on the Enlightenment are dissolving, but that this is the inevitable

course of progress.[17] All forms of governance and culture have their day, and if there is to be progress and new ways are to emerge, the old ways must be seen to have run their course and begin to fragment and dissolve so that a new paradigm can emerge. I have proposed that three developments may point toward the next evolutionary way station for humankind:

- the emergence of complexity science,
- an appreciation that our emotions are a positive evolutionary advantage rather than a flaw to be overcome, and
- a focus on relationships rather than simply on individuals.[18]

Such a 'new Enlightenment' will not come easily because it will be opposed by both those who remain attached to the thinking based on the European Enlightenment of the seventeenth and eighteenth centuries and those who gain from a return to the Hobbesian world that Gray describes. But, if we do not destroy ourselves through climate catastrophe or nuclear holocaust, we have the possibility of moving through the painful transition of the present times into a new way of engaging with each other and our wider global environment. Our survival and that of many other species on our planet depends on whether we can produce such an outcome from our present travails.

Notes

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