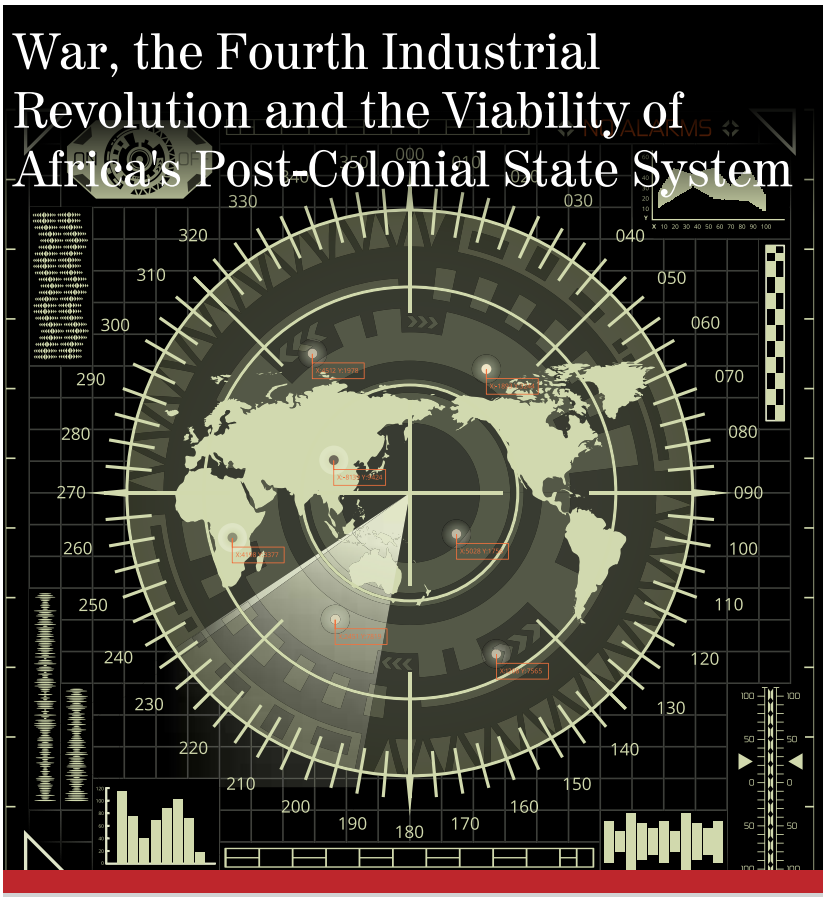
War, the Fourth Industrial Revolution and the Viability of Africa's Post-Colonial State System



Far removed from the immediate unfolding human tragedy and the true madness in the theatre of campaigns, the prospect – ushered in by the fourth industrial revolution – of emotionally sanitised conduct of warfare outside the traditional battlefield poses a mortal threat to all humanity.

By Ademola Araoye

War is the exercise of force for the attainment of a political object, unrestrained by any law save that of expediency.[1] It is therefore an act of violence intended to compel our opponent to fulfill our will. Violence arms itself with inventions of Art and Science in order to contend against violence.[2] War is a problematic existential reality and the technology that it has inspired over the centuries, has a paradoxical nexus to human progress and well-being.

On the one hand, war has become more and more cataclysmic violence with ever escalating catastrophic consequences for humanity. This has been the outcome of exponential increase in destructive power in the face of unrelenting scientific advances, in particular in applied military technology. As the outcome of the Manhattan project (or in the official codename 'Development of Substitute Materials') demonstrated, war efforts across nations have often instigated scientific breakthroughs with unimaginable devastating implications for the "human animal".

Michael Prior observes that within the first two to four months following the bombings of Hiroshima and Nagasaki, the acute effects had killed 90,000-146,000 people in Hiroshima and 39,000-80,000 in Nagasaki; roughly half of the deaths in each city occurring on the first day. Many more would die from radiation effects in the years to come.[3] Meanwhile, on 17 October, 2017 North Korea's deputy UN ambassador warned the UN disarmament committee that the situation on the Korean peninsula "has reached the touch-and-go point and a nuclear war may break out any moment". He went on to claim that all nuclear states were accelerating the modernisation of their weapons and "reviving a nuclear arms race reminiscent of [the] cold war era". The North Korean Ambassador reportedly noted that the nuclear weapon states, including the United States, boycotted negotiations for the Treaty on the Prohibition of Nuclear Weapons that was approved in July, 2017 by 122 countries at the United Nations.[4] With advances in war technology and attitudinal and institutional lags in mitigating the dangers by catastrophic violence in leading elite states, humanity faces absolute and complete destruction that may lead to our annihilation, and a possible rise of a long predicted insect age in an atmosphere-less planet.[5]

There is also a terrifying new lexicon of war machinery and accessories including Improvised Explosive Devices, robots, stealth, unmanned aerial vehicles and lately 'invulnerable' hypersonic nuclear weapon delivery systems. Included in this lexicon of horror is the D3000, the Chinese 98-foot-long, stealthy robotic trimaran warship designed to operate autonomously for months. The stand-off between Donald Trump's USA and North Korea's Kim Jong Un or the United States and Iran as well as Israel versus Iran over the development of nuclear capabilities all reflect the real time dangers posed to global

and regional balances of power by the military scientific explorations of hegemonic world powers and aspiring elite powers.

It is in this context that the fourth industrial revolution has transformed the nature and conduct of war in such a way that questions may be asked with regard to the continued viability of states that are so technologically backward they have not attained the threshold of even the first industrial revolution. Also, what is the impact of advances in technology on warfare, notably information technology, for both who possess it and those who – to a greater or lesser extent – do not?[6] Indeed, what are the defensive options for those states that do not possess high-technology weaponry and skills?[7] These are mainly post-colonial states in Africa.

Technology assures the survival of states and societies: in war, health, economy – and it is even crucial in the projection of hegemonic culture as soft power. The fundamental logic is that the leverage for global influence is enhanced by a nation's demonstration of a formidable nationally based indigenous scientific expertise and capability, especially in the realm of applied military technology, including in the exploration and militarisation of space.

In instances the pivotal individuals and brains driving national scientific endeavors considered threatening to the strategic interests of its real time enemy states are neutralised. Four Iranian nuclear scientists – Masoud Alimohammadi, Majid Shahriari, Darioush Rezaeinejad and Mostafa Ahmadi Roshan – were assassinated between 2010 and 2012. Another Iranian scientist, Fereydoon Abbasi, was wounded in an attempted murder. Many have suggested that they were assassinated by Israeli agents. Israel has neither confirmed nor denied its involvement, but Israeli Defence Minister Moshe Ya'alon intoned that Israel will act in any way and is not willing to tolerate a nuclear-armed Iran. Israel prefers that stopping the Iranian nuclear programme be done by means of sanctions, but in the end, Israel should be able to defend itself.[8] The objective of such assassination is often to deny that nation the benefit of the dividends of major scientific breakthroughs that would enhance its military capability and profile as a major power.

To mobilise to win World War II, the United States attracted foreign Jewish scientists who played significant role in the development of military science and technology that proved decisive to the outcome of the war. These included physicists Albert Einstein, who petitioning with fellow scientists, instigated the Manhattan project. J Robert Oppenheimer, Richard Feynman, and Edward Teller were critical to the success of the Manhattan Project and the development of the first nuclear weapons.

Also, Britain in the Second World War was unambiguous that it was fighting an industrial war, bolstered by advances in science and technology

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and by galvanising the country to produce more food, more planes, more tanks. The industrial production of more of everything was at the heart of Britain's war effort. The training and doctrine of the British Army reflected a readiness to deploy technology by sacrificing steel rather than human body: "Steel over Flesh". On the Axis side, the Third Reich also projected that her prowess lay in its mechanised might and that was at the forefront of its propaganda and the war itself.[9]

On the other hand, technology consciously inspired by war purposes has impacted constructively in advancing the well-being of society. The unraveling of the secrets of splitting a uranium atom by German physicists in 1939 and the desperate follow up in a three nation wartime collaborative Manhattan project ended World War II with unimaginable devastation. Yet, nuclear technology also ultimately opened the flood gate to the innumerable peaceful uses of atomic energy. This paradoxical connectedness has long generated an intense discourse regarding the relationship between war and human progress.[10]

Notwithstanding the stalemated outcome of this intellectual jousting, preparation for war since antiquity has been unrelenting, through modern civilisation and the first industrial revolution ushered in by the increased use of steam power, the development of machine tools and the rise of the factory system, through to the nuclear age that is being transformed in the evolving fourth industrial revolution. This fourth industrial revolution that is defined by the deployment of an array of digitally based inventions, has remained a critical catalytic agent in human affairs, civilization and development.

In the digital age, noting that the world is on the cusp of the fourth industrial revolution that he described as a seismic shift that is beyond anything humankind has experienced, German economist Klaus Schwab observes that the first, second and third industrial revolutions gave us steam power, electricity and electronics respectively. Though these are no doubt great technological achievements, Schwab advances that the assortment of emerging technologies associated with the fourth industrial revolution – artificial intelligence (AI), the Internet-of-Things (IoT), 3D printing, bio printing, gene editing, autonomous vehicles (AVs) and so on, the world as we know it today will be transformed in unprecedented ways.[11]

This will undoubtedly have unimaginable implications for the strategic vision of the political class, tactical and operational levels of war planning and execution. Already, it has been proposed that it is time for decision-making in the British Army to be better informed by data and real evidence – not simply military judgment, which is what is taught in Staff College.[12] Also, in the United Kingdom there is an increased focus on the new technologies, capabilities

and doctrines (including cyber and electronic warfare, leading to the establishment of the Information Warfare brigade, robotics and artificial intelligence, air and missile defense, anti-submarine warfare, hardening and rapid dispersal). These are projected to be key in maintaining the United Kingdom's military credibility over the next ten to fifteen years.[13] Meanwhile, Russia has announced the launch of its 'invulnerable' hypersonic nuclear weapons. China's rapid progress in developing and exporting armed and unarmed Unmanned Aerial Vehicles has significant implications and is undercutting long-running US efforts to control the spread of this technology around the world.[14] Also, China's artificial intelligence robots could triple the country's production of bombs and shells by 2028. Meanwhile, China has turned to robot automation to populate ammunition factories because the country is running out of human workers.[15]

These strides are linked to a new dimension of a global arms race. The emergence of autonomous and remotely controlled systems as mature weapon systems has taken half a century to arrive, but there are signs that by 2035 such systems will be able to mitigate for scale and mass in warfare.[16] A top British intelligence expert had proclaimed that the US military will have more robot soldiers on the battlefield than real ones by 2025. Deadly combat robots are rapidly becoming a reality of modern day warfare. Also, the US is allegedly looking to have a military edge over other countries like China and Russia in the next 10-15 years. This is said to explain an invested intensity of effort in research and development of robotics systems.[17] Questions however are being raised as to the overall implication both at the strategic and tactical levels, of these developments. The question is posed that if the West is to place a robotic war fighter in the driving seat, will this provide the decisive edge in warfare or will it simply slow down decision-making and provide enemies with advantages of pace and tempo?[18]

These developments, including explorations of the opportunities and challenges involved in human-machine combat teaming for naval warfare in the future,[19] among others, impact the evolving anatomy of warfare. Given the already changing anatomy of war, including the emergence of asymmetric warfare, underpinned by clashing ideo-philosophical and religious/ civilizational confrontations driving new forms of hostilities between states at one level, and between states and organised bands of forces of non- state entities at another level, the fourth industrial revolution has demonstrated its potential, in horrific ways, to further diversify warfare. That is in spite of the many beneficial revolutionary transformations for human welfare associated with the digital age in non-military spheres.

Wars are fought along three levels: the strategic, at which the broad high level objectives, often political, are enunciated; the tactical entailing the battles and brutal engagements – what John Holland describes as the "coal face of war"; and the operational or logistical – "a nation's ability to produce war materiel, tanks or aircrafts and deliver them to the front line".[20] This diversification, the outcome of transformations in tactical and operational levels of warfare, is expressed in the multi-dimensional character, changed nature and increased intensity of a comprehensive warfare executed in a fluid battlefield defined and controlled in situ campaign operational headquarters. The headquarters may target, and may choose to discountenance harm to unarmed civilians caught up with identified villains, at the other extreme end of the world. The battle field is surreal as a reality that is virtually defined on laptops in operational bunkers and headquarters 10,000 kilometers away from the assumed enemy and targets in the digitally simulated cross-hairs.

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The new war in the digital age is actually a virtual tragic but real live game. There are multiple dimensions of the use of cyberspace for hostilities by state and non-state actors. Cyberspace is the term used to describe the electronic medium of digital networks used to store, modify and communicate information. It includes the Internet but also other information platforms that support businesses, infrastructure and services.[21] Some individuals and groups, classified as 'hostile actors', use cyberspace for malicious purposes. The British MI5 highlights that these 'hostile actors' exploit cyberspace to conduct espionage operations or launch damaging computer network attacks. It notes that hostile actors include foreign states, criminals, 'hacktivist' groups and terrorists who target the interests of enemy governments and states. The resources and capabilities of such actors vary. Foreign states are generally equipped to conduct the most damaging cyber espionage and computer network attacks. Hostile actors conducting cyber espionage can target the government, military, business and individuals. They use computer networks, for example, to steal large volumes of sensitive data.[22] In worst case scenarios they have shut down the operations of large businesses and compromised national data systems.

The British MI5 officially perceives cyber espionage as an extension of traditional espionage. It allows a hostile actor to steal information remotely, cheaply and on an industrial scale. It can be done with relatively little risk to a hostile actor's intelligence officers or agents overseas. The MI5 calls this activity Computer Network Exploitation (CNE).[23]

Hostile coordinated intrusions into cyber space have also proven to be efficient for psychological dimensions of war fare. Al Qaeda and the Islamic state (ISIS) have perfected diffusion of the beheadings of their hostages in the public glare to shock the world. Non state forces thus project terror on digital platforms as a validated instrument of war. However, this mindset applies to both organised state

forces which project power through the deployment of unmanned aerial vehicles, but in particular to non-state forces. In fact, terror, spread through digital platforms, is a main weapon of asymmetric warfare.

Thus cyber war goes beyond disruptions of the normal functioning of society and the government through hostile hackers. The more deadly games on computers often accept significant euphemistically expressed 'collateral damage' of unarmed human civilians and communities as legitimate victims of war. Massive human collateral deaths inflicted by computer directed unmanned aerial vehicles are often rationalised away by the political authorities of elite state forces. The ascent of hostilities through digital related platforms and media implicitly reflects the evisceration of moral restraints imposed on the conduct of armed hostilities by contemporaneous advances in technology.

The fourth industrial revolution, coinciding with the resurgence of unbridled nationalist fervor and explicitly expressed Islamophobia across the United States and also in Western Europe is reminiscent of the late 1930s and 40s. This volatile historic conjuncture portends the danger of the validation of unlimited and unregulated digital hostile campaigns against weak 'shithole' societies and the many perceptually defined discounted external Others by emerged powerful nationalist Orders. This consolidates unmediated nationalism, fundamentalist Christendom, white WASPian bigotry and racism in which the USA and Europe are together, in their undisguised racial hatred against black humanity. In the 1930s and 1940s Europe, anti-Semitism was fair game. In the second decade of the Third Millennium, resurgent anti-black racialism is fair game. What then do the crucial transformations and developments in the digital age portend for weak states increasingly inching to the periphery of global relevance? This refers in particular to the post-colonial states of Africa.

In the context of the rapid transformation in the character of war, any orchestrated plan to subjugate or degrade to the point of irrelevance and or loss of integrity, including physical, psychical and material well-being of a community, people or race, state, nation, with or without the consent of the targeted group, constitutes a war. Massive and organised use of coercion and physical violence such as full blown military campaigns associated with the conventional understanding of war are the last desperate instruments of the offending power to force the capitulation of the target population. The ultimate strategic objective of war is to eliminate or degrade or completely neutralise the overall capacity to even forge an overarching and timeless vision of its sense of self and determine the direction of its development.

The political system and the underpinnings of the national political, social and economy of the target community or entity is compromised. The economy is sabotaged, the authentic identity deformed, community spirituality distorted with massive internal defections and migration to the gods of the conquering overlords. The spiritual realm, as Africa continues to experience, is a potent platform for the subjugation of a people. It is the most efficient of conventional soft power. As Britain's Chief of the General Staff General Sir Nicholas Carter pointed out, there are no longer two distinct states of peace and war.

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Visionless states, as in most of Africa, as individual entities or and in their collectivity as in the African Union are vulnerable targets. In general, whatever narratives are forged to rationalise their strategic objectives, elite states are almost always on the offensive. Weak states are defensive. The permanent war against black Africa is illustrative of this. The evidence is overwhelming for the discerning and informed.

In a world dependent on technology, those who control it will wield tremendous power. Hence, it is advanced by experts that it is foreseeable that in the era of the fourth industrial revolution, the state's influence will progressively be eclipsed by those companies that control the technologies associated with this seismic shift. Yet, Tak Ten Boon also proposes that the state will be needed to provide security. Whether it is in fending off terrorists or hackers, in the state's role as protectors of the integrity of both the national and the integrated global digital systemic platforms will actually become more important. Boon concludes that while private enterprises do perform a number of ancillary security functions, public safety and national defense still rest principally with the state.[24]

It is here advanced that, as the full import of the digital age unfolds, the global, regional and continental disparities in technological capacities would be manifest in the strengthening of the notion of a weighted integrity of the humanity of races, as opposed to the commonality of humankind. This would be especially so if the evolution of the international state system or structure of global social and political organisations lag behind those of private and corporate forces driving terrific technological advances across state borders.

As a result of the widening disparities, the scientifically progressive but morally retrogressive societies and races would rapidly disengage from the fraying understandings of the commonality and equality of all humanity, as mainstream humanity thrives in the new and exciting frontiers of the digital age. This is premised on the continued fixation of the largely unviable post-colonial states in Africa on their antiquated systems and structures that rest on problematic axiomatic foundations of its excruciating

dependency, numerous contingent statehoods, fictive sovereignties and the pervasive dysfunctionality of the political culture and internal processes that have left the post-colonial state bereft of any meaningful relevance in mainstream humanity's expansion of the frontiers of the digital revolution.

The abysmal prospects of the post-colonial state are reflected in the very low technology index hovering around 2.5, given the far-reaching consequences of the fourth industrial revolution for social progress, stability and economic transformation in more advanced states. In 2005 (the latest report available) the United States had the highest global technology index at 6.24. It was followed by Taiwan at 6.04. Finland came in third position with 5.92. With the exception of South Africa (4.33) and Mauritius (4.19) in the high index zone, Botswana (3.70) leads the middle African technology group comprising Egypt (3.68), Ghana (3.21), Tanzania (3.12), Zimbabwe (3.04), Nigeria (2.99), Zambia (2.98) and Mozambique (2.89). African countries bring up the rear of the global technology index. Malawi (2.74), Algeria (2.67) Madagascar (2.64) Mali (2.52) Angola (2.3) Ethiopia (2.17), Chad (1.81). A significant number of states in sub-Sahara Africa are actually nil or unrecorded on the technology index.

The technology index denotes the country's technological readiness across the realm of businesses and economy. This index is created with such indicators as companies in the geo-political space spending on R&D, the creativity of its scientific community, personal computer and internet penetration rates.[25] Also, a somewhat more comprehensive New Economy Index deploys 25 indicators to measure the extent to which economies are knowledge-based, globalised, entrepreneurial, IT-driven, and innovation-oriented.[26] Meanwhile, different geographies and political jurisdictions that may also translate into sovereign states play specialised roles in the global economy. Robert D Atkinson and John Wu highlight that some regions engage in what is termed by economists as "seedbed" functions through specialisation in cutting-edge innovations. This entails the development of new products and firms. Other regions, they note, offer attractive environments for company headquarters or other management activities. Still others specialise in more routine production functions for goods or services, handling aspects of the work that involve less innovation and have lower skill requirements. Finally, some regions, in particular those often tagged as developing economies, specialise in resource production tied to geographical endowments, such as raw minerals, arable land, agricultural produce, or lumber.[26] These are the low technology indexed zones that are often contrived to be dependent.

There is high correlation between low technology index and state by state estimates of the percentage of the population lying below the poverty line. The estimates are based on surveys of sub-groups, with the results weighted by the number of people in each group.[27] The first 14 places on the global poverty grid are occupied mainly by sub Saharan African states. They include, in order of depth of poverty, Zimbabwe (80%), Chad (80%), Democratic Republic of the Congo (71%), Sierra Leone (70.2%), Nigeria (70%), Swaziland (69%) Burundi (68%), Sao Tome and Principe (66.2%) Zambia (64%) Niger (63 %). Comoros (60%), Namibia (55.8%), Malawi (55%) Senegal (54%). 11 of the top 13 countries by population below poverty line are Sub-Saharan African. Nigeria has ranked in the top 2 for population below poverty line since 2000.

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In the past, as contemporaneously clearly illustrated in the Donald Trump USA syndrome, the unfounded attribution that industrialised societies have emancipated themselves from irrational and primitive aspects of their nature instead of having merely changed the character of their aspirations in directions perhaps as irrational as those of their ancestors was long declared a mere conceit.[28] In the miasma of the ascendant extremism of the times, defining war continuously is bedeviled by deep semantic challenges, given its variant meanings in different historical contexts.[29] In 1939, nationalism and militarism were the driving forces in the western world giving rise to the emergence of National Socialism and Nazism in the Third Reich and Fascist Italy under Mussolini. The outcome, as history instructs, was war. With Trumpism as a dominant ideology in the United States, is the world already at war? The enterprise of defining war thus requires some discretion, especially in the technologically constrained post-colonial state environment.

If unending preparation for war is a potential catalyst for social progress in advanced states and societies or a harbinger of unlimited devastation for communities still below the first industrial revolution at the cusp of the fourth industrial revolution in an era unhinged from moral restraints, what is the potential ultimate fate of technologically backward 'shithole' post-colonial states? And what is the locus of the post-colonial army in relation to evolution of global trajectories in technology? What is the antecedent of the military, the median profile of elite drivers of policy related to the military in the post-colonial environment? What are roles of exogenous factors and forces in the strategic and operational character of post-colonial armies?

For now, even though violence conventionally remains the core activity in warfare, definitions of war, as with any social phenomena, are varied. Defining war may reflect a range of divergent influences that may include the worldview, including understandings of human nature, the philosophical outlook, even theoretical orientations as well as the political persuasion and specific circumstances of the scholar and often times spokespersons of state actors and non-state protagonists. The definition of war is also often obfuscated by the imperatives of diplomacy. The

challenge of defining war has been compounded by the constantly evolving anatomy and dimensions of warfare since antiquity. The dramatic evolution, including the catastrophic consequences, of war has been most pronounced since the world was launched into the nuclear age on 16 July 1945. The nuclear age was presaged in 1938, when three chemists working in a laboratory in Berlin made a discovery that would alter the course of history: they split the uranium atom.[30]

The splitting of the atom led to an arms race that remains uncontained till today. The nuclear age was birthed in the labours of 130,000 men and women who went to work on a $2.2 billion mission that furiously pushed science, technology, engineering, and society into a new age.[31] They worked across three major laboratories at the Columbia University, the University of Chicago and the University of California at Berkeley. Nuclear facilities were also built at Oak Ridge, Tennessee and Hanford, Washington. The main assembly plant was built at Los Alamos, New Mexico. The three nation collaboration on the atomic bomb involved the United States of America, the United Kingdom and Canada. The legacy of the Manhattan Project was an immediate ending to the Second World War. Atomic bombs over Hiroshima and Nagasaki has permanently etched a security dilemma as a constant calculus in the permutation of potential systemic war. The outcome of the Manhattan project however also laid the foundation for nuclear medicine and great advances in physics, mathematics, engineering, and technology.[32] Social progress and modernity has since been associated with civilian use of technologies originally designed to gain advantage in war theatres.

Meanwhile in contemporaneous times, nearly 25 percent of China's ammunition factories have had their human workers replaced with "smart machines." Since China introduced automation to the factories, the Artificial Intelligence – equipped with man-made 'hands and eyes' – have been almost 5 times more productive than human workers and can assemble various ammunition including artillery shells, guided bombs, and rockets with the kind of efficiency and perfection some human workers struggle with.[33] It is against this background that General Robert Fry has identified at least four evolved dimensions of warfare outside the conventionally organised deployment of mass of armed men and materiel in violent confrontations and battles with each other. The evolved kinds and dimensions of war between state and non-state entities include terrorism and asymmetric warfare, economic warfare, cyber warfare. To this can be added biological warfare. General Fry specifies that the wars of post 9/11 bear very little resemblance to the wars of the 20th century. He advances that contemporary wars:

> *...are not wars between nation states. They are between nation states and non-state actors. Sometimes they are between groups of non-state actors. It is a global phenomenon and it is not about formed armies or defining your battlefields involving large contact battle until a decisive outcome. There are no longer any definitive instruments of surrender, rather conflict is insidious, ambiguous and comes and goes in heaps and flows.*[34]

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As General Robert Fry further notes, the battle field has in turn become diffused, a battlefield less easy to categorise and define that involves innumerable imponderables.

The character of protagonists in direct engagement is evolving from states to non-state, stateless and non-governmental entities in warfare principally against states and other non-state militias. The combatants in the last genre of warfare are faceless and undefined religious fanatics and ideologues. Their weapons system has included cudgels, deadly kitchen knives, home-made bombs, exploitation of target infrastructure including transportation systems, nerve agents and immense psychological use of terror on the side of the non-state forces. To counter the imaginative arsenal of the asymmetric warriors, elite states have developed more robust, intrusive and penetrating intelligence structures, stealth surveillance, and drones. Training and doctrine have evolved to adjust to the peculiarities of the new genre of warfare.[33]

Armies are modernised and restructured by principally increasing capacity to deploy special operations forces such as the United Navy's SEAL (Sea, Air, Land) for optimal impact in fluid environments and battle fields to counter loosely but deadly organised non-state forces that often are backed by shadowy state structures of quiet allies. The US Navy SEAL teams are a component of the Naval Special Warfare Command. Among the SEAL's main functions are conducting small-unit maritime military operations that originate from, and return to, a river, ocean, swamp, delta, or coastline.(34) As the name suggests, they are trained to operate in all environments. Such is the reputation of the SEALs that the CIA's highly secretive and elite Special Operations Group (SOG) recruits operators from SEAL Teams. Germany's KSK Kommando Spezialkräfte (Commando Special Forces, KSK) is an elite special forces military unit composed of special operations soldiers selected from the ranks of Germany's Bundeswehr and organised under the Rapid Forces Division. KSK has received many decorations and awards from NATO, the United States and its affiliates and KSK operatives are frequently requested for joint anti-terror operations, notably in the Balkans and Middle East. The Special Air Service (SAS) is a special forces unit of the British Army that may be equated with the Navy Seals. The SAS was founded in 1941 as a regiment, and later reconstituted as a corps in 1950. Like the American SEALs, German KSK, the SAS are

deployed in operations including covert reconnaissance, counter-terrorism, direct action and hostage rescue. Meanwhile, the successful development of a recommended Combined Joint Expeditionary Force would avail Britain and France a highly trained pool of forces capable of a wide range of missions up to high-intensity combat. It is perceived that given the troubled state of international security, opportunities for deployment of the Combined Joint Expeditionary Force into action should not be lacking, whether as part of a multilateral operation – for example, under UN or NATO auspices – or as a bilateral deployment in circumstances where both countries (the United Kingdom and France) have interests at stake.[35]

The state of international society that includes the transformation in its sensibilities that have tended to delegitimise violence as a currency of transactions between states is an important development in the moral climate and the political context in which war takes place in the digital age. War, even as instrument of the last resort in the conduct of international relations, has become morally contentious even if not absolutely obsolete.

The invasion of Iraq by the United States under George W Bush against a restraining United Nations resolution remains a defining demonstration of the de-validation of unilateral declarations of war by powerful state actors. Concepts such as Responsibility to Protect (R2P) remain suspicious as clever attempts by elite states to circumvent emerged sensibilities of the international community to restrict violence as the final arbitration of relations among states. Any definition of war thus proposed carries with it particular political or philosophical perspectives with their associated implications.

Meanwhile, varying traditions of definitions of war have been noted by major philosophers as well as military strategists. Marcus Tullius Cicero (106–43 BCE), a Roman philosopher, observes that since there are two ways of settling a dispute: first, by discussion; second, by physical force; and since the former is characteristic of man, the latter of the brute, resort to force is only in cases where avenues for discussions are not available. Even then he stresses that in external relations between states, the rights of war must be strictly observed. For Cicero, the only excuse, therefore, for going to war is that we may live in peace unharmed; and when the victory is won, we should spare those who have not been blood-thirsty and barbarous in their warfare.[36] Basing his treatise on his understanding that human nature and human reason abhorred war, Cicero argued that there was no acceptable reason for war outside of just vengeance or self defence – in which he included the defence of honour. He also argued that a war could not be just unless it was publicly declared and unless compensation for the enemy's offence had first been demanded.[37] A necessary condition for war was therefore to exhaust possibilities of negotiated resolution, consistent with the fundamental code of human beings and nations. Cicero styled war a contention by force.[38]

Hugo Grotius adds that "war is the state of contending parties, considered as such"; Thomas Hobbes highlights the attitudinal dimensions of war. "By war is meant a state of affairs, which may exist even while its operations are not continued"; Denis Diderot comments that war is "a convulsive and violent disease of the body politic"; for Karl von Clausewitz, "war is the continuation of politics by other means", and so on.[39]

Warfare has now been transformed into a holistic enterprise beyond what the military alone or mere brute force or muscular bravado can handle. In the fourth industrial era, war is more about the application of daring scientific operations conducted from seats of technological power in impregnable bunkers whose walls are lined with a vast bank of flashing computers manned by emotionless generals very much attuned with Einstein's theories under the command of warped political overlords. Far removed from the immediate unfolding human tragedy and the true madness in the theatre of campaigns, the prospect – ushered in by the fourth industrial revolution – of emotionally sanitised conduct of warfare outside the traditional battlefield poses a mortal threat to all humanity. ■

References

1. Colonel F N Maude, Introduction to Carl von Clausewitz, *On War*
2. Carl von Clausewitz, *On War*, Chapter 1
3. Michael Prior, Nuclear Weapons, Are We facing Armageddon? *The Thinker* Vol 75.
4. Ibid
5. Niall Ferguson, *The War of the World*, Epilogue, (Penguin Group, United States of America, 2006).
6. Greg Mills, *The Security Intersection, The Paradox of Power in an age of Terror*, (Wits University Press, Johannesburg, 2005)
7. Ibid.
8. 'Assassination of Iranian nuclear scientists'. Source: https://en.wikipedia.org/wiki/Assassination_of_Iranian_nuclear_scientists
9. James Holland, *The War in the West*, Volume II (Bantam Press, London, Johannesburg, 2017)
10. John U Nef, *War and Human Progress: An Essay on the Rise of Industrial Civilization*, (Cambridge: Harvard University Press: 1950)
11. Tan Teck Boom, 'Weapons of Mass Disruption: The Fourth Industrial Revolution', *International Policy Digest*, 30/10/2016 is here
12. General Sir Nicholas Carter, Chief of the General Staff's Keynote, Wednesday 28 June 2017, RUSI Land Warfare Conference.
13. Malcolm Chalmers, 'Decision Time: The Annual Security Capability Review, 2017-2018 and Defense'. Source: https://rusi.org/publication/whitehall-reports/decision-time-national-security-capability-review 2017%E2%80%932018
14. Scott N. Romaniuk and Tobias Burgesss, 'China and the Globalization of Armed Drone strikes'. Source: https://rusi.org/publication/rusi-defence-systems
15. Christina Zhao, 'China's Robots will Triple Bomb and Ammunition Production Capacity by 2028'. Source: http://www.newsweek.com/
16. Preview of RUSI–The First Sea Lord's Sea Power Conference 2018. Source: https://rusi.org/SeaPower2018
17. Shrishti Deoras, 'For US & China Military, the Future is Robots. How is India Competing?' Source: https://analyticsindiamag.com/us-chinas-military-future-robots-india-competing/
18. Preview of RUSI, op.cit
19. Ibid
20. James Holland, op.cit
21. https://www.mi5.gov.uk/cyber
22. Ibid
23. Ibid
24. Tan Teck Boom
25. http://www.nationmaster.com/country-info/stats/Economy/Technology-index
26. Robert D Atkinson and John Wu, 'The 2017 State New Economy Index', Source: https://itif.org/publications/2017/11/06/2017-state-new-economy-index
27. Ibid
28. Economy > Population below poverty line: Countries Compared. Source: http://www.nationmaster.com/country-info/stats/Economy/Population-below-poverty-line
29. Donald C. McKay, cites John U. Nef, op. cit
30. Ibid
31. 'The Manhattan Project, America in the Second World War', Source: http://wwwushistory.org/us/51.asp/
32. Tatiana Juarez, 'The Manhattan Project'
33. Robots replaces humans in 25% of China's ammunition factories, January 4, 2018 *Nigeria Tribune* Online
34. Lt Gen. Robert Fry, 'The Relevance of Special Forces in Contemporary Military Operations', The Africa Lecture, 2013, *Africa Today*, Vol 19, No 08/09 2013
35. Peter Ricketts, 'National Security Relations with France After Brexit'. Source: https://rusi.org/publication/briefing-papers/national-security-relations-france-after-brexit
36. Cicero on Just Wars, Source: https://satyagraha.wordpress.com/2012/04/19/cicero-on-just-war-theory/
37. History of War Ethics. Source: http://www.bbc.co.uk/ethics/war/just/history.shtml
38. *On the Laws of War and Peace*, Chapter 1, (Batoche Book, Kitchener, Canada, 2001) Source: https://socialsciences.mcmaster.ca/econ/ugcm/3ll3/grotius/Law2.pdf
39. Internet Encyclopedia of Philosophy (IEP). Source: http://www.iep.utm.edu/war/