Future of Land Warfare:
A Global Perspective

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Introduction

War is always a messy business. It brings in its wake, a tremendous amount of death, destruction and devastation. In an idealistic world, one would banish war for good. However, we live in an imperfect world wherein human egos, greed, power, religion, revenge, etc. have a major role to play in shaping the environment. This ushers in the inevitability of war as the final arbiter in deciding which way the world should move at a particular point of time in history. We are also aware, of course, that history has a way of repeating itself, thus, underlining the frailty of the human mind in repeatedly falling prey to the same mistakes and not learning much from the past.

Warfare is perpetually evolving. From ancient times, when foot soldiers held sway with swords, spears, bows and arrows, and used forts and obstacles for effective defence, it moved to the use of elephants and horses to provide enhanced mobility and raised platforms for dominating the foot soldier. Introduction of dynamite brought about a revolutionary change in the concept, methodology, conduct and execution of warfare. A similar effect was created when the tank, followed by the aircraft, entered the battlefield. A study of the two World Wars fought in the 20th century clearly brings out how rapid changes in mobility, lethality,

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battlefield transparency and precision affected the very methodology of the conduct of warfare from one to the other, thus, dictating the outcomes. Of course, use of nuclear weapons at Hiroshima and Nagasaki added a dimension, the consequences of which have threatened the very existence of mankind.

Unfortunately, the advent of nuclear weapons has not stopped the evolution of warfare. We are now delving into Artificial Intelligence (AI), robotics, cyber and space warfare to achieve victories in conflicts, with maximum destruction to the adversary and least own casualties, while remaining below the nuclear threshold. Thus, while the devastating potential of nuclear weapons is well acknowledged, the attempt is to win wars in the backdrop of a nuclear holocaust while continuing to remain within the conventional threshold.

Most strategists adopt previous wars as models to predict the future environment of warfare which then becomes the basis for developing force capabilities for the future. While this approach is logical and has worked reasonably well in the past, the changes currently taking place in areas which have a bearing on the future battlefield environment are so cataclysmic and huge that an incremental approach to future war-fighting is hardly likely to succeed. These changes require out of the box thinking, not necessarily in sequential order, to throw up innovative solutions which would then lead to success. Therefore, it would only be right to first study the future battlefield environment, successively followed by the role and future of land warfare.

Future Battlefield Environment

Unlike in the past, a future battlefield is likely to be non-linear in nature wherein neither the front nor the rear would be clearly defined. Actions undertaken at a strategic level may have a direct bearing on battles being fought at the tactical level and vice versa. It would be a multi-dimensional battlefield, employing physical, economic, psychological, cyber, space and

information warfare domains simultaneously to impact the outcome of a conflict on an adversary.

The attempt would be to demoralise the adversary and break his will to fight. The United States (US) executed such a strategy during the Iraq War with considerable success. However, while this strategy worked against an established regime in an all out war, wherein all the above domains could be freely used, it may not work when operating within restrictions and constraints in limited wars. Thus, when the US had to undertake counter-insurgency warfare operations against the Taliban in Afghanistan, the success was minimal as the fighting was way below the conventional level, restricting the US' ability to optimally employ all components to achieve the desired success.

Similarly, Sun Zi advocated winning wars without firing a round. This is done by the use of diplomatic, economic, military, psychological and informational domains to pressurise the adversary.[1] Currently, China seems to be achieving its objectives in the South China Sea in relation to its disputes with its smaller neighbours by pursuing this strategy, thus, strengthening its stranglehold in the region. Likewise, China has also violated the United Nations Convention on the Laws of the Seas (UNCLOS) as well as decisions of the International Court of Justice (ICJ).

In this perspective, for a comprehensive understanding of the future battlefield environment, it becomes imperative to analyse the different components that would constitute it and have a decisive impact on the outcome of the conflict.

Battlefield Transparency

It is a well-known fact that the greater the knowledge about the adversary, his dispositions and capabilities, the higher the chances of success in a conflict. In view of this, use of satellites, Unmanned Aerial Vehicles (UAVs), drones, etc. has resulted in providing total battlefield transparency on a real-time basis. It helps in breaching the adversary's

secrecy and enhances knowledge about his activities, their pattern as well as the future course of action he is likely to adopt. This knowledge is invaluable in preempting his actions and taking suitable steps to thwart his plans and defeat him in detail.

The depth and range of battlefield transparency would vary depending on the level at which an operation has to be executed. Thus, while for a company or battalion level operation, transparency of up to 10-15 km may suffice, at the brigade and higher levels, the depth of transparency requirement is likely to successively shift from the tactical to the strategic domain, going up to 100 km and beyond. This transparency has, of course, to be shared across the horizontal spectrum besides the vertical one since operations in one sector may have a bearing on other neighbouring sectors.

With the vast number of means available to achieve battlefield transparency, the danger is of surfeit of information gathered not getting systematically collected, collated and analysed, thus, defeating the objective. It is, therefore, important to have a trained organisation to shift through the plethora of data gathered in order to arrive at meaningful results which can be communicated in real-time for decisive action.

Artificial Intelligence (AI)

In a future battlefield environment, AI is likely to play a major role for a number of reasons. Firstly, it would help in reducing human casualties by virtue of being used to carry out tasks generally assigned to humans in a battlefield. Secondly, intelligence programmed in the machines is likely to be much faster and more precise in a set of given situations, thus, achieving results on a real-time basis. Thirdly, the ability to analyse complex options based on specified inputs is likely to be higher than that of average human beings. Of course, unpredictable and unforeseen situations would always remain the preserve of the human mind but a majority of such situations in a battlefield fall in the predictable pattern, enabling use of AI. Fourthly,

AI does away with emotions like fear, stress, tension, fatigue, response to injury, etc. whose effect can lead to adverse outcomes in a battlefield. It concentrates on rational decision-making.

As the frontiers of science expand wider and deeper, the potential of exploiting AI is increasing tremendously. Combined with robotics, AI is headed towards virtually removing the human being from the battlefield. The US is already experimenting with ocean-going drones in the form of mini human-less ships hunting for hostile submarines and destroying them.

Research is also ongoing in the field of autonomous weapons. Once fully developed, these weapons will be programmed to identify the enemy through the maze of the battle, target him and use precision munitions to destroy him whether during day or night. Use of driver-less fighting vehicles in the battlefield is also inching gradually towards reality. With such revolutionary changes on the horizon, transformation in the methodology and conduct of warfare is bound to take place.

Purely from an ethical perspective, there is a serious debate on whether AI should be used at all during war. In a 2018 survey carried out by the Brookings Institution, it was found that just 30 per cent of the adult internet users felt AI should be developed for warfare, while 39 per cent negated its use, with the balance being unsure.[2] However, if adversaries were already developing such weapons, then 45 per cent felt that the US too should do it while 25 per cent still felt that it would be ethically wrong to use AI during war.[3] However, notwithstanding the debate, if it gives a distinct advantage in the battlefield by its use, there is no doubt that AI would be put to use by both sides.

Cyber Warfare

Cyber warfare is the use and targeting of computers, online control systems and networks in warfare. It involves both defensive and offensive operations. Today, most modern militaries are becoming increasingly

dependent on computers since these have tremendous applications in almost all aspects of warfare. Vulnerability of computers and networks to cyber attacks has opened up the whole new field of cyber warfare. Russia, China, Iran and North Korea are way ahead of the others in this field.

The command and control chain from the lowest to the highest levels, inclusive of tactical as well as strategic operations, is controlled through networks and communications engineered with painstaking efforts. The best of military plans need efficient systems for passage and execution of directions/orders to achieve success at the ground level. Breach or hacking of control systems and networks can wreak havoc due to loss of security or blackout of directions at crucial periods during ongoing operations, resulting in possible failure.

In a future battlefield environment, increasing use of cyber warfare will bestow its practitioners with tremendous gains, far out of proportion with the efforts employed. No wonder, most militaries are working towards ensuring efficient use of their own networks and systems while, at the same time, degrading the adversary's and rendering them ineffective.

Space Warfare

In a broad understanding, militarisation of space is understood as the placement and development of weaponry and military technology in outer space. For instance, the early exploitation of space in the mid-20th century had a military motivation, given that the US and Soviet Union used it as an opportunity to demonstrate ballistic missile technology and other technologies having the potential for military application.[4]

It remains indisputable that space is the next dimension that would be added to the complex and dangerous battlefield environment of the future. China, Russia and the US are all taking steps that will ultimately result in weaponisation of space. North Korea launched two satellites in 2012 and 2016 that can threaten the US by guiding its Intercontinental Ballistic Missiles (ICBMs) to attack the US with an Electro-Magnetic

Pulse (EMP) as part of a larger surprise assault aimed at crippling the US military. The North Korean satellites that orbit over the US are on trajectories consistent with surprise EMP attack—with one of the two satellites always in orbit directly over the US at any point in time. An EMP attack could severely disrupt America's electricity grid, telecommunications, transportation network and other forms of critical infrastructure. China sees space warfare as its best chance to compete with the US militarily, since it has no blue water Navy, nor anywhere near the assets and firepower capability that the US military has. Rather than trying to match the US military and Air Force, China believes it can gain an advantage by effective use of space through production of specialised missiles, spacecraft and platforms.[5]

What advantages do space-based weapons provide to a nation? Firstly, use of directed energy e.g. laser, radio frequency, etc. from space enables destruction of an adversary's ballistic missiles, hostile aircraft, susceptible sensors and communication links and space-based satellites. Secondly, space-based weapons provide an additional option, which in certain time critical situations may be the only option to take on an adversary's hostile weaponry and destroy it. Thirdly, keeping in mind the battlefield environment, weapon delivery at the intended targets can be risk-prone and problematic, resulting in a higher failure rate. Space-based weapons provide relatively more secure and sure means of striking. Lastly, space-based weapons act like a bolt from the blue, thus, achieving much higher destruction as compared to any other vector. Of course, the effectiveness and destructive potential of space-based weapons will vary, depending on the weather conditions prevailing. Thus, atmospheric targets would be more susceptible to directed energy weapons in clear weather and air targets more vulnerable to energy that can be delivered at wavelengths able to propagate through the weather.

Jointness

Jointness is the integration of the strengths of the different Services of the military towards achieving a common goal. It enables development and execution of integrated operations by optimally using available resources and ensuring achievement of objectives in the shortest time. Today, it is accepted and practised as an essential for success.

Jointness is also compatible with network-centric warfare. Besides that, ideal utilisation of the cyber and space warfare domains is only possible in a joint and integrated scenario wherein the benefits would be shared across the inter-Service spectrum.

Jointness is intra-military in character and is a means that any good higher command organisation must seek to achieve. In its wake, it brings in synergy, optimum use, professionalism, economy of resources and a focussed approach. It avoids duplication and enables better exploitation of fleeting opportunities that so often present themselves in fluid battles. No wonder then that most modern militaries, including those of the US, Russia and China, have shifted to the Theatre Command concept wherein the resources of all the Services are placed at the disposal of the Theatre Commander to accomplish the tasks assigned. It increases the options available to the Theatre Commander to succeed. Unfortunately, the Indian military is still prevaricating on the degree of jointness to be achieved, with the three Services trying to protect their individual turfs. In the long run, this delay in operating in an integrated manner is likely to cost us heavily.

Precision Targeting

With the advent of lasers, radio waves, EMP, shoot and scoot capabilities, etc. precision targeting is likely to be the norm in the future. While battlefield transparency enables recognition and pin-pointing of specific targets, precision targeting ensures its total exploitation. It avoids collateral damage and concentrates on specifically destroying potential

threats. More importantly, it achieves a tremendous psychological advantage over an adversary since his vulnerability gets highlighted and he stands demoralised.

Wither Land Warfare?

The idea of nation-states incorporates the concepts of territorial integrity, land borders and sovereignty. We are as yet too far away from Wendell Willkie's "One World"[6] articulation. Any violation of the concept would be deeply contested at every step, by all means available to the affected nation-state. Thus, warfare is here to stay till as long as nation-states exist. In fact, it is the ultimate means of resolving disputes between nations when all other options have failed.

The notion of land warfare is an inherent and inalienable part of the overall concept of warfare. The fact that almost 75 per cent of the world's current militaries are ground forces, points to land warfare playing a predominant role in conflicts in the foreseeable future. To quote, Michael O'Hanlon posits that "modern war is becoming increasingly lethal and, thus, unforgiving to the unprepared, but it is not making ground combat irrelevant or obsolete".[7] It is the land domain, as compared to other domains of warfare like cyber, space, maritime and air that produces tangible and quantifiable results during conflicts. To which, David E. Johnson argues that the nature of the enemy and his will to continue fighting often can be countered and defeated only by ground forces, given that protracted air operations can be costly, with diminishing returns, while naval power has little effect to overturn enemy seizure or control of land, which also applies to cyber and space.[8] In view of this, the principal opportunity that land forces offer is the ability to impose a decision on adversaries that the other domains cannot: taking and holding ground, destroying enemy forces in detail and controlling and protecting populations.[9] Emphasising the importance of ground forces, Gen Mark Milley, the US Army Chief of Staff, in his address on June 23, 2016, at the Centre for Strategic and

International Studies (CSIS) in Washington, D.C., categorically stated: "I think we are on the cusp of a fundamental change in the character of ground warfare. It will be of such significance that it will be like the rifling of a musket or the introduction of a machine gun or it will have such significance impact as the change from horse to mechanized vehicles".[10]

However, the terrain over which the land forces have to operate can add to complexity and operational friction manifold. Thus, the terrain may vary from plain to riverine to desert to hilly or mountainous, making appropriate planning imperative for achieving success. Additionally, prevailing weather conditions also have a bearing on the outcome. To note, operations in Afghanistan, both now and during the occupation by the Soviet Union, show the effects of complex terrain. In view of this, the absence of roads and mountainous terrain make helicopters important in movement of forces, medical evacuation and resupply. However, the weather and terrain also make flying helicopters much more difficult than in Iraq.[11]

Science and technology are constantly being refined to achieve victory with more sophisticated weapons in the shortest possible time, with the least number of casualties. In fact, the concept of achieving victory by the use of air power and missiles, without committing soldiers on the ground, was tried by the US in the initial stages of the attack on Iraq. However, realisation that victory would not be possible without 'boots on the ground' soon dawned, leading to a subsequent change in the strategy and ultimate victory. In Afghanistan too, somewhat the same pattern was followed.

Of late, as witnessed in the case of the South China Sea, China is engaged in transforming the small islands and reefs into full-fledged military bases with a view to bolster its claims against other Southeast Asian nations. Such actions are also likely to be undertaken by other countries in the Arctic region in the foreseeable future. Although this

extends the spectrum of conflict to the oceans, ground/marine forces will still have a dominant role to play in deciding the outcome since physical occupation would be involved.

Threat Analysis

Three different types of threats, singly or all together, will manifest themselves in the future and would have to be tackled by the military. This can be explained in the following:

Non-State Adversaries

More popularly described as terrorists, this group is characterised by the philosophy of wanting the world to dance to their tune by indulging in acts of death and destruction inimical to mankind. Working individually or in groups, they do not enjoy formal approval of nations of the world for their actions.

They threaten to terrorise the world into submission and acceptance of their demands like ransom, release of prisoners, regime change, etc. while working individually or in small groups. In larger groups, they seek to impose a new world order. Thus, Al-Qaeda, Islamic State (IS), Lashkar-e-Taiba (LeT), etc. fall into this category.

A number of states covertly use such groups to achieve their ulterior designs while professing ignorance about their existence. Thus, the terrorist strike in Mumbai on 26/11, wherein LeT terrorists who attacked a number of installations, causing massive death and destruction, were clandestinely trained, equipped and inserted through the Arabian Sea with covert Pakistani support is a recent example. Despite concrete evidence to the contrary, Pakistan has steadfastly refused to accept its complicity in the Mumbai attack.

State Sponsored Hybrid Adversaries

These are threats posed by forces unleashed by an adversarial state. All

support in terms of planning, training, preparing and inserting hybrid adversaries is provided by the inimical state. Hezbollah in the Middle East, separatists in Crimea and *jihadists* in Jammu and Kashmir (J&K) are current examples wherein Iran, Russia and Pakistan respectively have provided support.

These hybrid adversaries, at the behest of the sponsoring state, work towards regime destabilisation, regime change or altering existing land boundaries. Their degree of success would vary depending on the resources available and the extent of popular support enjoyed by them. Their *modus operandi* is to target government institutions and policies and create conditions of unrest and uprising among the populace.

State Adversaries

When two states have major differences which cannot be resolved by all other available means, war is the ultimate option. While remaining below the nuclear threshold, they often take recourse to conventional war to settle differences, as exemplified in cases such as the Arab-Israeli conflicts, Indo-Pakistan Wars and ongoing conflicts in the Middle East.

In a future threat scenario, conventional war would be combined with the use of non-state adversaries as well as state sponsored hybrid adversaries to achieve rapid success. Simultaneous attacks from multiple directions targeting not only frontline soldiers but also rear and administrative echelons are likely to confuse and demoralise the adversary, ensuring his defeat in detail. This methodology is currently being applied in both Syria and Yemen.

Organisational Changes

With the battlefield environment and nature of land warfare undergoing major changes, it is imperative that organisational transformation takes place in sync with those changes to fight more effectively and efficiently. Integrated task oriented battle groups would be the norm rather than

large division sized formations of World War II mould. Special operations teams to carry out specific tasks for mission accomplishment would form an integral part of the battle groups. Airborne forces, capable of quick insertion into the battle zone to ward off a crisis or exploit fleeting opportunities need to be planned for. Here, shifting of forces from one theatre to another at short notice becomes especially relevant in the case of limited force levels or in the contingency of having to face a two-front threat. Acquisition of the requisite air transport lift capability for such an eventuality is imperative.

There should always be an effort to improve the 'teeth to tail' ratio wherein the logistic tail is reduced to the minimum essential while enhancing the fighting potential of the force. Thus, restructuring of the available force levels to achieve optimum results must be an ongoing process with changes in the organisation brought in on an as required basis. The US carried out specific organisational changes to meet the demands of the counter-insurgency operations in Afghanistan, notwithstanding its ultimate failure which is attributable to a number of other factors.

Land Warfare in the Indian Context

Since India became independent in 1947, it has had to fight a series of wars till date to maintain its territorial integrity, as noted in its wars against Pakistan in 1947-48, 1965, 1971 and 1999. In 1947-48 and 1965, Pakistan tried its best to wrest J&K by force by sending in irregular and regular forces. In fact, in 1965, the conflict took place all along the Indo-Pakistan border besides J&K. Both times, it was roundly defeated by the Indian military.

In 1971, Pakistan rode roughshod over the electoral results wherein Sheikh Mujibur Rahman's Awami League party of then East Pakistan had won an absolute majority in the Pakistan National Assembly. It jailed Sheikh Mujib and to quell the protests which erupted as a result, sent in the Army which indulged in massive plunder, rape and large scale

atrocities on the hapless population. There was worldwide condemnation of the Pakistan Army's reprehensible actions. Sheikh Mujib declared unilateral independence of the new entity, Bangladesh. India supported Bangladesh which resulted in an all out war with Pakistan. In one of the finest chapters in Indian military history, India achieved a huge victory, taking over 93,000 soldiers as prisoners while liberating Bangladesh.

In a clandestine operation, Pakistan attempted to capture Kargil and its surrounding heights in J&K in 1999 with the aim of severing Ladakh from the rest of the state. This attempt too was thwarted in a befitting manner, with the bold actions of the Indian Army and Air Force. Pakistan was forced to withdraw with huge losses.

While against the Chinese, India's ill-equipped Army lost heavily in 1962. However, in subsequent skirmishes at Nathula in 1967 and Wangdung in 1986, it gave an excellent account of itself. In fact, despite an active and tense border, with frequent Chinese transgressions, the Indian Army has been able to keep the territorial integrity of the country intact.

In addition, serious insurgent situations in a number of northeastern states in the second half of the 20th century, aided and abetted by our not too friendly neighbours, kept the Army on its toes. Commencement of insurgency in J&K with Pakistan's active support since 1989 and its containment has further added to the Army's responsibilities.

It would be clear from the above that for the past 70 years, land warfare has dominated the Indian subcontinent. This trend is likely to continue in the foreseeable future. With two recalcitrant neighbours and an unsettled land border of over 7,000 km, the threat of a two-front war looms large over India's horizon. Concomitant with the ongoing insurgencies in J&K and parts of northeast India, the Indian Army certainly has its plate full with commitments.

In this context, the moot question that arises is: what should be done to meet the challenges of the future? A number of issues have already

been discussed in the earlier part of this paper. Some major aspects, including those requiring reiteration, are covered below to enable the Indian military to develop capabilities for performing its tasks creditably in a future battlefield scenario.

Defence Budget

In an era when all modern countries are spending or are increasing their defence expenditure to over 2 per cent of the Gross Domestic Product (GDP), in India we have seen a declining trend for the past 8-10 years. The North Atlantic Treaty Organisation (NATO) nations are all working towards spending 2 per cent by 2024. In fact, President Trump is nudging them towards spending 4 per cent post 2024. Both China and Pakistan, our problematic neighbours, are spending over 3 per cent. On the other hand, during the last 10 years, the Indian defence budget has been gradually coming down from 2 per cent to 1.57 per cent in the current financial year. The Indian defence community has been clamouring for 3 percent defence budget for a long time. As the Parliamentary Defence Committee headed by Gen B. C. Khanduri (Retd) pointed out in its report in March 2018, 68 per cent of the equipment held by the Indian Army is obsolete. While that may have resulted in his being replaced as the Chairman of the committee, it nevertheless points to a serious danger to national security in the long run. The sooner we rectify the situation, the better.

Theatre Commands and Jointness

We have paid lip-service to jointness so far for all the wrong reasons like turf protection, Service loyalties, bureaucratic manipulation, lack of expert domain knowledge in employing other Services, etc. Unless there is an attitudinal change among the three Services towards integration, we are laying ourselves bare to defeat in detail in a future conflict. We can take solace from the fact that the history of integration in all modern

militaries throws up challenges like resistance to change, fear of being swamped by a larger Service, obstacles to individual Service growth, etc. The difference is that while most others have overcome apathy and resistance and gone ahead with integration, we, in India, continue to flounder in unnecessary debate and discussion. Promotion of jointness, and closer integration among the three Services is a strategic necessity. We need to create Theatre Commands, with resources pooled from all the Services to accomplish assigned missions during operations. Employment of all arms and Services by the Theatre Commander in a befitting manner to achieve optimum results will eventually happen only if we work at it from now on. Likewise, integration of Service Headquarters with the Ministry of Defence is imperative to undertake and implement national security issues in a more rational manner.

Higher Defence Organisation

A single point adviser to the Government of India on matters of defence and national security was first recommended by a committee of a Group of Ministers headed by the then Home Minister, Shri L. K. Advani, after the Kargil conflict. This was approved by the Cabinet under the leadership of Mr Vajpayee in 2001. However, 17 years down the line, we have still not implemented it. For informed decision-making in defence matters, the requirement of a Chief of Defence Staff (CDS) is imperative, especially when the political hierarchy as well as the bureaucracy have only limited/ negligible expertise on these matters. Additionally, structured institutionalised interaction between the Service Chiefs and the political hierarchy needs to be laid down in the interest of national security. The current practice of the Cabinet Committee on Security (CCS) summoning the chief only in times of crisis is hardly satisfactory. Perhaps, the crisis would not occur if regular interaction is in place.

Infrastructure Development

With unsettled disputes with our two neighbours China and Pakistan, the need to have good infrastructure to fight a successful defensive battle on two fronts can hardly be overemphasised. A number of our sensitive areas in Arunachal Pradesh, Sikkim, Uttarakhand and J&K are dependent on one single, tenuous road link even today, 70 years since independence. This makes logistics and sustenance as well reinforcement of forces on the front problematic. The situation gets worse if this single lifeline gets disrupted due to enemy action or natural disasters. The Chinese have created excellent infrastructure in Tibet in a much shorter timeframe. Lack of resources, environmental clearances, land acquisition, bureaucratic delays, etc. cannot be justifiable reasons for putting the territorial integrity of the nation in jeopardy. We need to take urgent steps to create suitable infrastructure in the forward areas to enable our soldiers to acquit themselves well in the face of aggression.

Finally, irrespective of the changes envisaged in the future battlefield environment, land warfare will continue to dominate conflicts between nations in the foreseeable future. This assertion is more pertinent in India's case since we have unresolved borders with two of our neighbours. It would, therefore, be important for us to always be prepared to face a two-front threat in our national security interest.

Notes

1. See, Sun Zi, *Art of War* (Mumbai: Wilco, 2009).
2. Darrell M. West, "Brookings Survey Finds Divided Views on Artificial Intelligence for Warfare, but Support Rises if Adversaries are Developing it", August 29, 2018, at https://www.brookings.edu/blog/techtank/2018/08/29/brookings-survey-finds-divided-views-on-artificial-intelligence-for-warfare-but-support-rises-if-adversaries-are-developing-it/
3. Ibid.
4. "Militarisation of Space", Wikipedia, at https://en.wikipedia.org/wiki/Militarisation_of_space.
5. Daniel Wagner, "Why Space Warfare is Inevitable", *International Policy Digest*, July 01, 2018, at https://intpolicydigest.org/2018/07/01/why-space-warfare-is-inevitable/.

6. See, Wendell L. Willkie, *One World* (New York: Simon & Schuster, 1943).
7. Michael E. O'Hanlon, *The Future of Land Warfare* (Washington, D.C.: Brookings Institution Press, 2018).
8. David E Johnson, "An Overview of Land Warfare", *The Heritage Foundation*, 2018, at https://www.heritage.org/sites/default/files/201709/2018_IndexOfUSMilitaryStrength_JOHNSON.pdf.
9. Ibid.
10. Quoted in Dave Majumdar, "Is the US Army Ready for a Shocking Technological Revolution in Land Warfare?", *The National Interest*, June 23,2016, at https://nationalinterest.org/blog/the-buzz/the-us-army-ready-shocking-technological-revolution-land-16703.
11. Mark Thompson, "Why Flying Helicopters in Afghanistan Is So Deadly", *Time*, October 27, 2009, at http://content.time.com/time/nation/article/0,8599,1932386,00.html.