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War and Technology: A Critical Investigation

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Abstract: In this article, I examine the relationship between technology and the conduct of war in order to consider whether and how technological development in military affairs makes the conduct of war barbarised/civilised. There are at least two different views on this issue: One view is that technological development has made warfare more barbarised and the other is that it has made warfare more civilised. These two views seem correct when considering that technological development in military affairs contributes to shaping the characteristics of warfare, some of which have the impact of increased barbarisation whereas others have the impact of increased civilisation during armed conflict. However, these two views do not seem to perfectly describe the relationship between technological development and the conduct of war in that technological development does not automatically determine the course of the barbarisation/civilisation of warfare. The primary reason for this is that the application of new technologies to military affairs and the actual use of technological artefacts (i.e. weapons and weapons systems) are undertaken in the politico-military context. I argue that such a course is primarily determined by the mode of warfare, which is strongly influenced by the strategic need, mission objectives and tactical environments which the political elite and military brass envisage. I conclude by arguing that it is not necessarily technological development *per se* that makes warfare civilised or barbarised. The core line of argument of this article is that whether and how warfare could be civilised/barbarised primarily depends on the political elite and military brass who can utilise technologies for military affairs.

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Introduction

It is often argued that technological development in military affairs has made modern warfare more barbarised than ever. Contrary to this idea, it is also argued that technological development has made warfare more civilised. These two technology-focused views seem correct to the extent that technological development in military affairs contributes to shaping the characteristics of warfare. These views, however, raise concerns about potentially oversimplifying the relationship between technological development and the conduct of war since the role of technology to influence the conduct of war is excessively emphasised.

In this article, I examine the relationship between technology and the conduct of war from a less technology-oriented point of view in order to consider whether and in what respect technological development in military affairs makes the conduct of war barbarised/civilised. In order to consider this issue, an initial outline of the two technology-focused views will be presented, and then the discussion will move on to examine non-technological factors that potentially influence the characteristics of warfare.

This article is divided into four sections. Initially, I will briefly consider the meanings of civilised and barbarised in order to lay the foundation for the investigation regarding the relationship between technological development and warfare. Secondly, I will examine the primary two technology-focused views regarding several weapons and weapons systems in order to clarify the points of argument in these two views. Thirdly, I will consider the parameters of weapons and weapons systems in order to clarify what we expect and require of weapons and weapons systems and how technological development contributes to improving these parameters. Finally, I will examine the role of intentions in contrast with capabilities in order to consider how intentions influence the use of weapons and weapons systems to make the conduct of war civilised/barbarised.

1. The Meanings of being Civilised and Barbarised

In Section 1, I will consider the meanings of being *civilised* and *barbarised* in order to lay the foundation for the investigation of the relationship between technological development and warfare.

Civilised warfare might sound somewhat of an oxymoron since war usually implies violence and destruction, which in turn epitomise barbarity. Indeed, human beings resort to violence against each other by using any feasible means and methods to neutralise/destroy hostile military targets in order to defeat the enemy. In many armed conflicts, uncontrolled violence is often employed in several inhumane ways such as directly or indiscriminately targeting noncombatants, treating prisoners of war in an abusive way, and/or using an excessive force against legitimate/illegitimate military targets. In this sense, being barbarised may be characterised by uncontrolled violence and destruction at an excessive degree and scale, with no or little regards to the laws and customs of war.

If war, which is supposed to be a barbaric act, is characterised by uncontrolled violence and inhumane means and methods used in military operations, then civilised one may be characterised by controlled violence and humane means and methods employed in combat. A civilised war, therefore, may be defined as a war in which parties to the conflict and individual combatants of these parties follow the laws and customs of armed conflict, by withholding unlawful and/or inhumane war conduct. In the same vein, being civilised in war may be characterised by the restraints in violence, or more precisely, the use of controlled violence in accordance with the spirits of the laws and customs of war, which are in turn characterised by the use of minimum force necessary for neutralising the enemy forces. In other words, being civilised in war can be characterised by the following minimum force (i.e. civility) requirements: (1) the distinction between combatants and military objects as legitimate targets and non-combatants and civilian

objects as unlawful targets, and (2) the proportionality of damage caused as a result of legitimate attacks in relation to military advantage, actual or anticipated¹.

2. Two Views on Technological Development and Warfare

Having clarified the meanings of being civilised and barbarised in Section 1, in Section 2, I will examine the two technology-focused views on several weapons and weapons systems in order to clarify the points of argument in these two views.

It is almost undeniable that technological development in military affairs has introduced new, sophisticated, high-tech weapons and weapons systems. However, it is a point of contention as to whether or not it is primarily technological development that has made warfare more barbarised or civilised. Technological innovation in military affairs has made weapons and weapons systems more effective and reliable in terms of neutralising capabilities against targets. Furthermore, military applications of advanced technologies, together with technology-driven industrial production capabilities, have made new high-tech weapons and weapons systems not only widely available but also relatively affordable.

In this current climate of technological advancement in weapons and weapons systems, we can observe two different views on the relationship between technological innovation and barbarity/civility of warfare. On the one hand, we can argue that new technologies meliorate humanitarian situations in armed conflict. For example, new technologies are said to help speed up minesweeping². This technological innovation may potentially lead to a less number of victims and casualties otherwise caused by still activated landmines. If technological innovation in military affairs enables the attackers to neutralise enemy forces in accordance with the civility requirements in warfare (i.e. the principle of distinction and proportionality)³, then technological innovation may be considered serving civilising warfare. In this respect, we can agree with the argument that technological development in military affairs has made warfare more civilised by making weapons and weapons systems more efficient and effective in terms of capabilities to destroy/neutralise targets/objects.

On the other hand, we can also argue that new technologies deteriorate humanitarian situations in armed conflict. In this vein, Michael Howard argues that the development of weapons technologies has increased the destructiveness in war⁴. Indeed, technological advancement has brought uncontrollable destructiveness in contemporary armed conflicts; a prime example of this is the Second World War. Technological development in aerodynamics and aero-engineering brought long-range weapons delivery capabilities to the parties to the conflict, for example, B-29 long-range heavy bombers to the United States and V-series rockets to the

1 The idea of minimum force requirements is codified in the laws and customs of war.

2 Philip Morrison and Kosta Tsipis, 'New Hope in the Minefields', *Technology Review*, <http://www.technologyreview.com/Nanotech/11600>, accessed on 22/6/2007.

3 See, for example, David Oderberg, *Applied Ethics: A Nonconsequentialist Approach* (Oxford: Blackwell, 2000), pp. 214–25.

4 Michael Howard, *War in European History* (Oxford: Oxford University Press, 1976), pp. 102–3, at 116.

Nazi-Germany. In addition to these weapons delivery capabilities, technological development in weapons and weapons systems has culminated in the deployment of atomic bombs⁵.

In order to assess these two views, let us consider three different weapons and weapons systems; namely, AK-47 assault rifles, precision missile delivery capabilities, and nuclear capabilities. Firstly, let us consider AK-47 assault rifles. This type of weapons indicates a clear connection between technological development of weapons and barbarisation of warfare. Military applications of advanced technologies made sophisticated weapons widely available and more affordable to combatants all over the world. AK-47 and its variations have given users greater destruction capabilities than non-automatic, bolt-action rifles. Furthermore, technological development has brought industrial mass production system, which supplies the products to the users at a huge scale. As a consequence, wide availability (50–70 millions⁶), relatively low cost, simplicity and easiness to handle, and high reliability in extremely harsh environments—these factors have contributed to enabling pre-teen boys carrying an AK-47 in many conflict areas from the jungles in the central Africa and south-east Asia to the mountains in Balkan and central Asia⁷. AK-47s seem to make a strong case that the technological innovation in weapons has contributed to barbarising warfare.

Secondly, in order further to examine the influence of weapons and weapons systems upon warfare, the discussion must move on to consider precision strikes capabilities. Military applications of advanced technologies have enabled some of the most advanced militaries to have precision-strike capabilities with accurate weapons systems supported by robust C4ISR (Command, Control, Communication, Computer, Intelligence, Surveillance and Reconnaissance)⁸. John Davis argues that improvements in guidance technology on missiles made it possible to minimise collateral damage⁹. In Davis's words: 'The dramatic improvements in guidance technology thus made it more feasible than before to observe the just-war criteria of proportionality and discrimination between civilians and combatants'¹⁰. The precision strike weapons system seems a *prima facie* strong case that technological advancement has made the conduct of war more civilised.

Finally, let us consider the case of nuclear capabilities, which is more complex than the above-considered two cases. The issue of nuclear capabilities makes two opposite implications: one is that nuclear weapons have made modern warfare more barbarised than ever (pre-1945) as was evidenced in Hiroshima and Nagasaki, and the other is that nuclear capabilities have made warfare, less barbarised than before. The first view is that the nuclear capabilities have made the Second World War more barbaric than the previous warfare. Technological development in

5 Laurence Freedman, *The Evolution of Nuclear Strategy* 2nd ed. (Basingstoke: MacMillan, 1989), p. 16.

6 Amnesty International, 'The AK-47: the world's favourite killing machines', <http://web.amnesty.org/library/Index/ENGACT300112006?open&of=ENG-2U3>, accessed on 21/6/2007.

7 John Keegan, *War and Our World: The Reith Lecture 1998* (London: Pimlico, 1999), pp. 68–9.

8 For the conduct of US military in the Iraqi War, see, for example, James Turner Johnson, *The War to Oust Saddam Hussein: Just War and the New Face of Conduct* (Lanham, MD: Rowman and Littlefield, 2005), p. 133.

9 John Jefferson Davis, *Evangelical Ethics: Issues Facing the Church Today* 3rd ed. (Phillipsburg, NJ: Presbyterian and Reformed Publishing, 2004), ch. 10, pp. 255–61.

10 *Ibid.*, p. 256.

military affairs has brought nuclear capabilities, which epitomise uncontrollable destructiveness when deployed. It guarantees indiscriminate attacks against military and non-military objects alike. The use of atomic bombs in Hiroshima and Nagasaki confirms that nuclear weapons are the most destructive weapons which human beings have ever invented¹¹.

Contrary to the first view, the second view proposes that the use of atomic bombs in Hiroshima and Nagasaki was the final blow to Japan's war effort which forced Japan to decide surrender and thus saved the lives of hundreds of thousands of the US servicemen as well as millions of Japanese soldiers and civilians who were otherwise harmed in the foreseeable US landing on the Mainland of Japan. Along this line of thought, Robert Joseph, US Special Envoy for Nuclear Nonproliferation, commented that 'most historians agree that the use of an atomic bombs brought to a close a war that would have cost millions of more lives, not just hundreds of thousand of Allied lives but literally millions of Japanese lives'¹². If this is the case, this theory is further supported by Alex Roland who argues: 'The hundreds of thousands of lives lost at Hiroshima and Nagasaki must be weighed against hundreds of millions of lives saved by the existence of nuclear weapons'¹³. From this point of view, nuclear capabilities as the end result of technological innovation has contributed to making warfare less barbarised.

Following along this line of thought, it can be further argued that the possession of nuclear capabilities has made warfare less barbaric since 1945 because the possession has forced nuclear powers to be convinced of (the threat of) mutual assured destruction, and consequently prevented the nuclear powers from using the nuclear capabilities against each other¹⁴. Indeed since the Second World War, there has been no all-out war between the nuclear powers with one notable exception of the 1999 Kargil Conflict between India and Pakistan¹⁵.

Furthermore, the possession of nuclear capabilities as a means of deterrence— 'the creation of a state of reciprocal assurance that the initiation of the use of nuclear weapons by one side would lead to instant, inescapable, and unacceptable retaliation by the other'¹⁶—also seems to support the second view presented which argues that nuclear capabilities have made warfare less barbarised. It is possible to assume that since the end of the Second World War nuclear weapons have not been used because the destruction capabilities of nuclear weapons are so enormous that the superpowers could not afford to use them¹⁷. So despite being destructive if used, the possession of nuclear weapons has prevented fully-confrontational conventional war, let alone

11 Keegan, *War and Our World*, p. xiv.

12 States News Service, 'Briefing with Special Envoy for Nuclear Nonproliferation Robert G. Joseph and Russian Federation Deputy Foreign Minister Sergei Kislyak on Cooperation in Nuclear Energy and Nuclear Nonproliferation', 3/7/2007.

13 Alex Roland, 'Keep the Bomb', *Technology Review* Vol. 98 No. 6 (August 1995), pp. 67–9 at p. 67.

14 Keir A. Leber and Daryl G. Press, 'The Rise of U.S. Nuclear Supremacy', *Foreign Affairs* (March/April 2006), pp. 42–55 at pp. 42–3.

15 It must be noted that it is a matter of debate whether or not both warring parties held perceptions, convictions and/or capabilities of mutual assured destruction at the time of the Kargil conflict.

16 Howard, *War in European History*, p. 139.

17 Williamson Murray and MacGregor Knox, 'Thinking about revolutions in warfare', in Knox and Murray (eds.), *The Dynamics of Military Revolution, 1300–2050* (Cambridge: Cambridge University Press, 2001), pp. 1–14 at p. 11.

total nuclear war, between the two superpowers during the Cold-War: otherwise the Third World War might have occurred if it had not been for nuclear weapons. If accepted, this theory of nuclear peace is such that it would proclaim that nuclear weapons have saved the lives of more than 230 million people, who were otherwise lost their lives in a nuclear war¹⁸.

The above considered three weapons and weapons systems have shown that the two competing views on the influence of technological development upon the conduct of war seem correct to the point that technological development contributes to shaping the characteristics of warfare. The case of AK-47 has indicated the barbarisation of warfare, where combatants and non-combatants are often indiscriminately or directly killed or maimed.

The case of precision strikes capabilities has shown that technological development has achieved to deploy a weapons system that is capable of delivering accurate weapons to the precise positions where targets are located. Obviously, these precision capabilities are far from perfection. Preciseness of weapons delivery capabilities needs to be further improved, and the precision strike capabilities are also dependent on the robustness of C4ISR. Nevertheless, it may be correct to argue that if these precision strikes capabilities are used for the purpose of attacking military objects, then technological development that had brought the precision strikes capabilities are considered to contribute to making the conduct of war more civilised. Indeed those militaries who possess the precision strikes capabilities seem to primarily use these capabilities to neutralise enemy forces, and their conduct seems to somehow try to avoid or minimise so-called collateral damage.

The case of nuclear capabilities has been more controversial. On the one hand, it is arguable that nuclear capabilities are the most barbaric ones which technological development has brought to human beings. Indeed the use of atomic bombs has shown that these weapons have the most destructive capabilities and does exemplify barbarisation of warfare. On the other hand, it is also arguable that the use of nuclear capabilities has shortened the Pacific War and thus consequently saved the millions of lives otherwise killed in the future possible offensive in the Mainland of Japan. Furthermore, it is also argued that the threat of the possible use of the nuclear capabilities has made warfare more civilised since deterrence has worked.

3. Parameters for Weapons and Weapons Systems and Three New Trends

Having assessed the two technology-focused views in Section 2, in order further to assess the influence of technological development on warfare, in Section 3 I will examine the parameters of weapons and weapons systems, and then consider the new trends which political elite and military brass envisaged as a result of the introduction of new weapons and weapons systems.

Traditionally and until today, military applications of new knowledge and technologies to weapons and weapons systems have been aimed at maximising and further improving effectiveness and reliability in military capabilities with consideration of cost efficiency. In other words, what is desired and required for weapons and weapons systems may be characterised by three features: effectiveness, reliability and cost efficiency. Firstly, effectiveness; effectiveness that can be

18 Roland, 'Keep the Bomb', p. 68.

measured by neutralising capabilities or destructiveness is the most important feature of weapons and weapons systems because the purpose of weapons is to incapacitate enemy targets so that enemy forces cease hostilities. In this sense, weapons and weapons systems must be effective enough to ensure target incapacitation, which usually means physical destruction of human and non-human objects.

Reliability is another parameter for weapons and weapons systems. Reliability of weapons and weapons systems can be characterised by user-friendliness (i.e. accuracy, simplicity, toughness, and safety), while simplicity and toughness are relatively more crucial in weapons, these factors are hallmarks of weapons in the age of industrial mass production and globalisation. Technological innovation has made small weapons (e.g. assault rifles and other firearms) more accurate, widely available in terms of cost and quantity, and simpler and tougher for handling. Simplicity and toughness have also contributed to weapons demands, and globalisation has further escalated further proliferation of these weapons. In addition, technological development has enhanced safety for users, which can be measured by remoteness from danger. Modern weapons and weapons systems have enabled users to extend the distance from danger. An example of this is the latest bomber aircrafts with stealth technologies that can evade air-defence radar systems and attack targets from a high altitude where enemy antiaircraft weapons and weapons systems are no use. Technology-laden armours and protection gears can also make users insulated from danger¹⁹.

Finally, cost efficiency; cost efficiency is measured by the opportunity cost for the plan, design, test, production and deployment of new technology-loaded weapons and weapons systems against conventional ones in terms of effectiveness and reliability. For example, it might be arguable from the perspective of cost efficiency that it is better-off to keep nuclear capabilities because the opportunity cost to replace the nuclear weapons system would be astronomically higher than the maintenance cost at the current level of technology.

However, it is worthy of note that the conception of effectiveness in weapons and weapons systems has been changing in the milieu of contemporary strategic thought and requirements in that effectiveness is not only measured by optimised neutralising capabilities but also by capabilities for distinction, proportionality and eco-friendliness. Similarly, the conception of reliability has also been changing by stressing safety of users, which can be specified by enhancing protectiveness and remoteness of soldiers in or away from the battlefields. The emerging trend in weapons and weapons systems can be characterised by three factors, namely, discrimination, reduced lethality and safety for users characterised by distance from danger.

Firstly, distinction. Over the past 60 years, a distinction between military objects as legitimate targets and non-military objects as prohibited target has increasingly been considered as one of the factors that determine effectiveness in weapons and weapons systems. This trend is mainly reflected in the provisions of international humanitarian law (IHL), which proscribe direct attacks against noncombatants²⁰. The capabilities in regard to distinction serve not only a

19 In the case of the US Army, this idea is exemplified in the concept of *future force warrior*. <http://ffw.natick.army.mil>, accessed on 23/11/2007.

20 For example, see, Article 51 of Protocol Additional to the Geneva Conventions of 12 August 1949, and relating

humanitarian cause by sparing damage to non-military objects but also military economy-assured destruction ensured by accuracy and precision capabilities. If correctly used along with a right intention to incapacitate enemy forces and minimising collateral damage, then precision strikes capabilities may claim to contribution to make warfare civilised.

Secondly, reduced lethality. In the modern war and war-like situations, the concept of effectiveness in weapons and weapons systems seems to have been changing in such a way that less-lethal, yet sufficiently incapacitating capabilities are expected to be incorporated in the concept of effectiveness²¹. These weapons may be called non lethal weapons or 'less lethal weapons'²². The increased use of this type of weapons in combat reflects the mode of military operations and the change of perceptions towards noncombatant casualties. In current armed conflicts and post-conflict situations, soldiers are increasingly expected to play noncombat roles such as peace-keeping, quasi-policing and riot control. In these circumstances, they are expected to deal frequently with civilian mobs, demonstrators, looters and members of criminal groups than armed combatants. In order to deal with these non-regular members of armed forces in the noncombat situations, soldiers are expected to use less lethal means and methods. In fact, the United States, for example, has shown its interest in less-lethal capabilities and funded research on these capabilities²³.

Finally, safety for users which can be characterised by distance from danger. Military applications of advanced technology to weapon delivery capabilities in the Western countries may make the war civilised on the side of attacking forces (i.e. Western militaries). The US military has been developing various types of unmanned planes: some have already been deployed, and others are still under development. For example, the Predator and the Global Hawk have been used for mainly surveillance and reconnaissance in Bosnia, Afghanistan and Iraq. Recently, it is reported that the CIA-operated Predator drones armed with missiles have been deployed for attacking enemy combatants in Yemen²⁴, Iraq²⁵, Pakistan²⁶, and Afghanistan²⁷. These drones satisfy the three parameters for weapons and weapons systems: effectiveness, reliability and cost efficiency²⁸. Above all, unmanned aircrafts almost certainly guarantee safety of users if we

to the Protection of Victims of International Armed Conflicts.

21 Christopher Coker, *Humane Warfare* (London: Routledge, 2001), pp. 88–90.

22 Richard A. Muller, 'Less Lethal Weapons', *Technological Review* (14/5/2004), <http://www.technologyreview.com/Infotech/13608/>, accessed on 21/6/2007.

23 Mark Wheelis and Malcolm Dando, 'Neurobiology: A case study of the imminent minitarization of Biology', *International Review of Red Cross* Vol. 87 No. 859 (September 2005), p. 564

24 Walter Pincus, 'U. S. Strike Kills Six in Al Qaeda: Missile fired from Predator Drone', *Washington Post* (5/11/2002), A1.

25 Douglas Jehl and Eric Schmitt, 'After the War: Manhunt; U.S. bombs convoy of fleeing Iraqis', *New York Times* (22/6/2003), A1; Dafna Linzerand Griff Witte, 'U.S. airstrike targets Al Qaeda's Zawahiri', *Washington Post* (14/1/2006), A9.

26 Craig Whitlock and Karen Khan, 'Blast in Pakistan kills Al Qaeda Commander: Figure reportedly hit by U. S. missile strike', *Washington Post* (4/12/2005), A1.

27 Doug Struck, 'Casualties of U.S. miscalculations: Afghan Victims of CIA Missile Strikes described as Peasants, not Al Qaeda', *Washington Post* (11/2/2002), A1.

28 David Talbot, 'The Ascent of the Robotic Attack Jet', *Technology Review* (March 2005), <http://www.technologyreview.com/Infotech/14221/>, accessed on 21/6/2007.

compare these remote-controlled drones with conventional attack jets and helicopters.

4. Capabilities and Intentions: Strategic Need and Mission Objectives

Having considered the parameters of weapons and weapons systems and their new trends in Section 3, in Section 4, I will examine the weapons and weapons systems from the perspective of intentions and purposes to use in order further to explore how civility and barbarity of warfare are characterised.

The genesis of the new trends in the parameters weapons and weapons systems seems not in technological development *per se* but other external factors such as strategic need and environments and mission objectives. The military mission and objectives are determined in the politico-military context, and the military mission is executed by the armed forces. This set of factors may be called strategic thought.

If we look at the history of strategic thought, it seems clear that there are two different ideas running in parallel: one is the idea of total war, and the other is the idea of limited war²⁹. The barbaric side of warfare can be found in the idea of total war, and the civilised side of warfare can be found in idea of limited war. These two ideas are not new: both have existed in parallel throughout the history of strategic thought. To look closely, in the history of modern warfare, it is the Second World War when the balance of the two ideas has shifted toward limited warfare. Military purposes in the Second World War are total and indiscriminate destruction on the enemy population and infrastructure. In the age of total war, the war-fighting capabilities are determined by the optimal use of weapons and weapons systems whose effectiveness is primarily measured by neutralising capabilities. Contrary to this, at the end of the Second World War, the idea of limited war resurrected in IHL, most notably the Geneva Conventions³⁰. In the post-WWII milieu, the idea of limited war predicates nuclear-free wars regulated by the laws and customs of war³¹.

The question which we have to ask ourselves is, to what extent we have become to oppose the idea of total war? In the post-WWII period, we can find two turns of casualty-aversion in the thought of limited war: one is intolerance to combat casualties, and the other is that to civilian casualties. The first turn of casualty aversion occurred around 1960–70s. Since the Vietnam War, countries in the West have become intolerable for mass-casualties of their members of armed forces, especially for missions that may be considered non-vital for national defence and territorial integrity³². Indeed there were few armed conflicts since the 70s in which homeland defence of the Western countries was at stake³³. The second turn of casualty aversion occurred in the post-Cold War period. The Western countries have also become intolerable for mass-casualties of civilians

29 A.J. Coates, *The Ethics of War* (Manchester: Manchester University Press, 1997), p. 6.

30 Thomas G. Weiss and Cindy Collins, *Humanitarian Challenges and Intervention* 2nd ed. (Boulder, CO: Westview Press, 2000), pp. 27–9.

31 Brian Orend, *The Morality of War* (Peterborough, Ontario: Broadview Press, 2006), pp. 21–2.

32 Coker, *Humane Warfare*, pp. 78–9.

33 One notable exception that territorial integrity of a Western country (in this case, Britain) is the Falklands War of 1982.

even in the conflicts which were not considered as a direct threat to their homeland defence. Furthermore, the idea of limited war has put into practice in the post-Cold War 90s, the characteristics of the use of military force have changed as we see West's humanitarian military expeditions in Somalia, Haiti, Kosovo and Sierra Leone. In these military expeditions, the missions and objectives of expeditionary forces have shifted from major war fighting to humanitarian missions policing and riot-control in post-conflict situations³⁴. In other words, military force has increasingly been used not primarily for destroying enemy forces, but for protecting local residents in a target country.

Having clarified that strategic need and environments and mission objectives are the main contributing factors which shape the characteristics of warfare in the above-developed discussion, we may finally conclude the discussion by examining the relationship between technological development and barbarisation/civilisation of warfare. The above-discussed case of precision strike capabilities has shown that these capabilities are assumed to make warfare more civilised. However, in order to conduct precision strikes on military targets by taking into account military economy as well as humanitarian concerns, the attackers must almost always hold an intention to maximise military effectiveness and at the same time minimise unnecessary destruction. In other words, if technological development can help achieving these goals, then the first step to make war more civilised may be considered to be taken. However, the second step is primarily concerned with the wills and intentions of users of weapons and weapons systems. It is Michael Donelan who argues against technological determinism on barbarisation and civilisation of warfare: 'Technology is not our master; it is driven by our ideas. Our weapons are diabolical, but the Devil is not in them but in ourselves'³⁵. Donelan further argues:

A submarine is, at first, only a toy with an unknown, open future; what permits us to use it as a weapon against warship, an act at first considered abominable, and later to use it to sink merchantmen and passenger liners without warning, once unthinkably disgraceful, is a change in ideas of what is permissible in war. We design bombs which destroy cities because we have come to think that killing civilians is an acceptable way of winning³⁶.

If this is the case, then the question which requires our interest is: what are the ideas on war and weapons and weapons systems that people hold now?

Technological development in military affairs has granted us capabilities to influence the mode of warfare. However, the determinant to influence the mode of warfare is not capabilities *per se* but intentions to utilise capabilities for certain purposes. In this sense, the possession of precision strike capabilities is a necessary condition for conducting precision strikes, but not a satisfactory one. If we intend to prioritise the protection of civilians over military necessity, we can utilise the precision strike capabilities in order to minimise civilian casualties incidentally caused by an attack against military targets. If we intend not to prioritise civilian protection, we can choose not to use the capabilities for that purpose and let civilians harmed.

³⁴ Weiss and Collins, *Humanitarian Challenges*, pp. 30-7.

³⁵ Michael Donelan, *Elements of International Political Theory* (Oxford: Clarendon Press, 1990), p. 165.

³⁶ *Ibid.*

Technologies primarily predicate our capabilities. Capabilities often broaden options and choices which agents can take. In this sense, perhaps technologies influence the wills and intentions of agents. However, it is the wills and intentions of agents that may determine the direction of technological development. Intentions may primarily dictate the use of technology, not *vice versa*. This proposition can be clarified if we consider the nature of particular weapons and weapons systems. Take precision capabilities. Precision capabilities have been developed to meet the contemporary requirements of the norms of war: military necessity, proportionality and distinction. The precision capabilities would maximise their effectiveness if and when they are used along the above-mentioned requirements. Nevertheless, we can use these capabilities for the purpose of breaching the requirements if we intend to do so. To conclude, it is not primarily capabilities but intentions to make the conduct of war civilised/barbarised; in other words, capabilities, which are delivered by technological development, can be used as a vehicle of intentions, not *vice versa*.

Conclusion

In this article, I have considered the relationship between technology and the conduct of war in order to consider whether and how technological development in military affairs makes the conduct of war barbarised/civilised. New knowledge and technology have been used in the development, production and deployment of the weapons, and governments have spent an enormous amount of budgets on research and development of new military technologies and weapons and weapons systems. Having said that, it primarily depends on our ideas on war and war conduct whether or not warfare becomes civilised or barbarised. Technological development in military affairs gives us a choice whether to make war civilised or barbarised in the sense that advanced technologies have granted us capabilities to influence the mode of warfare. In this sense, we can say that military technologies do influence the means and methods of warfare.

We cannot be certain if technologies determine the nature and objectives of warfare. It seems plausible, however, that we can make use of technologies by applying them to military affairs in order to influence the mode of warfare as well as to make technologies contribute to certain goals in war. These goals are, in our contemporary situation, restraints of the use of military force in the legal, ethical, political and military terms. In conclusion, technological advancement in weapons and weapons systems has granted us highly effective, efficient war-fighting capabilities. It is not our war-fighting capabilities, however, but our wills, ideas and intentions that make war civilised or barbarised. If we have an aspiration to make warfare more civilised, then we can opt to use these advanced technologies and their artefacts for the purpose of controlling violence.

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