Inaugural Lecture:

'Forever Vigilant? Technology and the rise of boundless warfare

David J. Galbreath

Delivered at 18.15 on 22 Oct 2014

Deputy Vice Chancellor, Dean, Ladies and Gentlemen, I am honoured to be here today to tell you a story about one of the major social and political phenomenon that we know: war. It is in our news, in our conversations, our view of politics, our gut reactions, our film, television and literature. War is all around us. We can understand war as pejorative. As a stain on humanity. As an evil. As ultimate human chaos. We can also understand war as human expression, togetherness, order, and exacting. War, as a feature of our historical, contemporary and future societies holds us by our hearts. And minds. As Chris Hedges writes ‘War gives us meaning.’

My road to war, or rather to war studies, is not one of blood lust, patriotism, a military background, or family history. It is one of an intellectual entrepreneur. As Haruki Murakami says in his book Dance, Dance, Dance, we are all shovelling snow of one kind or another. I shovel intellectual snow. This intellectual curiosity has led me from post-Soviet affairs, minority rights, international organisations, foreign policy analysis, race and ethnicity to graffiti and disruptive art. Yet, all of these areas of study, graciously supported by the British Academy, Leverhulme Trust, ESRC, AHRC, EPSRC, Ministry of Defence, and US Department of State have always revolved around conflict and insecurity. I will never forget that while doing my PhD and looking for signs of democratization and ethnic conflict, I was disappointed to see so much ethnic diversity but so little conflict. Good for them, a pity for me then, good for me now.

Rene Descartes argued in his work on dualism that there was a distinction between the mental and the material. This distinction sticks with me and will be looked at here.

4 years ago I began to look at the changing nature of how technology impacted politics. More specifically, I was interested in how changes in technology and science were opening up, changing the rules and even reasserting what we know of as possible, preventable and desirable. I have been teaching international security for 10 years. In 2009, I was asked to teach a European security course, by then the editor-in-chief of European Security, that someone else had been teaching and I noticed that there was no information on militaries. There was much on geo-politics, the causes of war, the rise and fall of ethno-nationalist violence but nothing on those at the coal face of war itself: militaries.

So, I decided to add a lecture on contemporary European militaries only to be confronted with a paucity of literature on the contemporary European military. It was in this search for literature that I found Chris Dandeker's work on risk and complexity in the emerging global system, entitled 'New Times for the Military:
Some Sociological Remarks on the Changing Role and Structure of the Armed Forces of the Advanced Societies’ published in the British Journal of Sociology. A military sociologist at King’s College London, Dandeker argues that the British military, and those whom serve in it, are facing a changing world which he refers to as ‘shift leading to risk’. Tim Edmunds at the University Bristol wrote in a similar way in his 2006 article, ‘What Are Armed Forces For? The Changing Nature of Military Roles in Europe’ published in International Affairs. Another sociologist, Anthony King at the University of Exeter, was also important in illustrating the comparative context of change in his 2011 book The Transformation of Europe’s Armed Forces: from the Rhine to Afghanistan. Finally, it is this shift leading to risk that I am most interested in here today.

I argue here today that the shift leading to risk is technology and the rise of boundless warfare. What do we mean by technology? Technology here is understood as writ large: techno-science. Technology is an enabler. It enables geo-location, keeping boots off the ground, and tapping into your and my communications (big data). It also allows for greater lethality, more pursuit, and the accumulation/dispersal of power. Technology is satellites, networks, processors, personal computers and robots. But it is also the result of material, biological and chemical sciences. Perhaps even more contentious is the combat soldier as a technology. In Anthony King’s latest book, The Combat Soldier, we can see how the combat soldier as a martial technology has developed. The concept of the soldier, of the warrior, even what gender theorists would point out has having been constructed as a ‘man’, is technology. Here I want to talk about technology in terms of space, time and force, which will be affected by all of these technologies in some way or another.

Space (distance, dispersal, concentration), time (t1, t2) and force (mass, acceleration) allow us to talk about how technology is interacting with war. Let us come back to this after we discuss bounded and unbounded war.

Notice in the title of the event, I did not use the term unbounded war. I use boundless warfare because I make a distinct point of whether bounded warfare can become unbounded or whether boundless warfare is something else entirely. Not what we know as bounded warfare changed, but instead an emerging form of warfare altogether.

We can understand technology as applied, as used, as passive. I have agency. The technology does not have agency. Many scholars are looking at the impact of technology on defence in this fashion such as UAVs and airpower, processing speeds and big data, networked enabled forces and command and control. Now, let me say here where my colleague and researcher Manabrata Guha comes in. Manav’s work, and that of his long time mentor Mick Dillon and others, suggest that to understand technology simply as applied is misleading. Rather, they understand technology differently. We can understand technology as a system, a way of doing things. This is a pervasive understanding of technology. Another way to say it is that technologies provide governmentality. Ways of understanding, of knowing, of seeing, of governing. The focus on the system is highlighted in Manav’s book Reimagining War in the 21st Century published in
2011 as a distinction between the Cartesian ‘love for the system’ and the Newtonian ‘value of the system’.

For those that have followed me up until this point, might see this as technological determinism. Allow me to illustrate to you a case that highlights the difficulties in talking about a one way relationship of technology to agency or agency to technology. In Ruth Miller’s book *Snarl: In Defence of Stalled Traffic and Faulty Networks*, she uses an interesting historical example to illustrate the power of technology once applied. The example is an interesting one because it shows us an early version of ‘dual-use’, a category today that suggests a technology has both civil and martial applications. In the 18th century, the city of Paris was covered in paving stones to cover what would ordinarily be dirty cum muddy city streets. Paris was not the first to do this nor obviously the last. But, in this case the martial qualities of the paving stones fundamentally changed the system in which prior political, power relations had once stood. She shares a quote from a French Civil Servant at the time,

‘[paving stones] offer the most suitable material for the construction of barricades in the moments of civil war. It was this that in June, 1848, the streets of Paris were covered in a few hours with a series of citadels which cannon balls could hardly demolish. Much bloodshed would have been spared on both sides, if such materials had not existed so close to hand. The government of the French Republic, deeply impressed with the magnitude of this danger, called the serious attention of the engineers of the Paris roads to the necessity of replacing the ancient system of stone paving by some other, which would not offer materials for the construction of barricades….’ p26

Miller argues that roads, as a networked technology, must be understood to play a constitutional role, a system role in which the world as we know it operates. She states ‘[our roads] are at war regardless of the needs, desires and activities of class human citizen-subjects’ p29. ‘We can think about how (...) the transformation of stone paving into barricades and weapons turns roads, regardless of the people on them, into physical environments of military activity.’ p55

Might we even go further to say that one could write a history of wars as non-human battle? If so, where does the political agency fit in here?

Allow me to bring this back to the study of bounded and boundless warfare. What do we mean by bounded warfare? We can think of it through two lenses. The first is the political or democratic lens. The relationship between war and states or nations has been long studied. This conversation goes like the chicken and the egg, which came first? Do states make wars or do wars make states? The wars of France, revolutionary, Napoleonic, or otherwise, one could argue have made the France that we know today. These wars fit as between two book ends. They are bounded by beginnings and ends, by epochs or eras, by political narratives. We understand the wars against Napoleonic France or Nazi Germany. They give us meaning.
The War against Terrorism? War again Drugs? Do they give us as much meaning? My assumption would be far from it. They are not existential. Terrorism nor drugs will wipe us off the map. Exterminate us. Starve us. This is not say that polices to protect us from terrorism and drugs are not right, proper, necessary even. But they are not wars because they do not give us meaning. Not because there aren't strategies, deployments, tactics, causalities.

What is meant by boundless warfare? Warfare needs an enemy. Warfare has a start and an end. Warfare has discernable action/reaction. Warfare has ideology. These are three boundaries of warfare that, I argue, are becoming eclipsed by technology.

In 1984, George Orwell imagined war bounded by enemy, boundless by time. Oceania was always at war with either Eurasia or Eastasia. The enemy changed. The action did not. If we hold Chris Hedges quote that ‘war is a force that gives us meaning’ then we can see why the government of Oceania, and presumably Eurasia and Eastasia, would have used it as a means of control. Though clearly war, for the protagonist Winston Smith at least, has lost all meaning. Herein lies an allegory for how we might imagine the democratic response to boundless warfare.

What if we do not know whom is attacking us? What if we don’t see an end? What if we don’t know how? Would war still give us meaning?

Let us think of this in relation to how we think about war itself: as an extension of politics. Carl van Clausewitz states that war is a continuation of politics. Others, including Christopher Cooker at the LSE, talks about war as a function of human nature. We can refer to both of these approaches in thinking about the political human. Warfare is a human function. A social function. Within this political dynamic, we can think of three determinants or factors in war. They are information, citizenship and decision-making.

For Clausewitz, the political function existed within what he refers to as the trinity. For Andreas Herberg-Rothe, in his book Clausewitz’s Puzzle: The Political Theory of War, he states ‘[the Trinity] can be seen in particular in [Clausewitz’s] statement that war must remain subject to the action of a superior intelligence and has a political purpose.’ P.115

Herein lies a problem for us and our paving stones. What role does technology have in political purpose? Surely, a rioter has to choose to pick up the rock in order to throw it? The political purpose is the factor, the driver that leads the rioter to make the choice. To be an agent of violence. This conception of violence, or warfare in our case, requires a political human.

But let us assume that our conception of the political human, or at least the agency that he poses, is limited. In this conception of the political human we only have technical objects. Not technical agents. The technical agents of war like roads, like IT networks, like UAVs are themselves enablers. Agents.
Information, as it is, comes into being when it is processed. Its relationship to bounded warfare. In fact political purpose requires it.

Citizenship, as it is, determines the political. Sustains the political. We know whom we are. What we hold sacred.

Decision-making, as it is, defines the purpose.

Boundless warfare challenges a political theory of warfare, as Clausewitz’s ideas have been referred to by Herberg-Rothe. A technological theory of war aids our understanding of how warfare is shaped by system factors.

What if think of warfare, not as political behaviour but as technological behaviour, where does this leave the human? Could we transpose the political human with the technological human? What do mean by this? We don’t mean cyborgs or robots but something else. Let us return to Ruth Miller. She charts how English metaphors began to change from the 19th to the 20th century. She indicates that where before we had biological metaphors about human behaviour, by the middle of the 20th century, our language was being affected by information theory. The organism, human in our case, was no longer being understood as a single point, a single agent but instead was being understood AS a message. As communication. In other words, human value becomes increasingly roped into the system of communication. Now, others have talked about this in terms of the impact that cybernetics had on a wide range of discourses. If anything, information theory allowed us to think about how the system works together. For instance, how roads, drivers, cars, traffic, cities and so on could be understood as data, mapped and communicated. Miller argues that the cyberneticists were not taking dehumanising humans. In fact, she illustrates how they continued to view information theory through a subjective humanist perspective. Humans were still very much humans for the system revolved around humans. The system matters because humans matter. Miller writes ‘More damaging for our purposes,[her words], they were situating everything else within a human communicative framework’ (p.54).

A political framework.

And in so doing, ‘they were transforming the machine into a human – if a digitized human – and the physical network into a communications network. They were obliterating the machine both actually and rhetorically just as the machine was taking on a greater and greater role in the city, on the road, and on the battlefield’ (emphasis original). (p.54)

And she goes on talking about this humanised network, ‘When information and communication exit the picture, in other words, it becomes clear that both historic and contemporary military machines simply do not lend themselves to a user-tool analytical framework.’ (p.54).
Take roads again. We might ask the question how roads are militarised by populations. But we can also ask the question, how do roads militarize populations? In the case of the paving stones on Parisian streets, they became ‘barricades and weapons’ regardless of the people on them. They are physical environments of military activity. Surely they engage in human agency. But you could easily say it the other way around that human agency is determined by technological possibilities. Miller refers to this as a largely under-theorised type of non-human battle.

This allows us to talk about the growth in automatic, non-human modes of warfare. The very same ‘modes of warfare that seem so shockingly irrelevant to human ethical norms.’ P.55.

**Technology**

Let us stop and talk about technology because you came here today to listen to me talk about what I call ‘tech, mech and flex.’

**Known knowns**

We live in a world where networks continually take over our world. They are seen as being applicable to everything. Not just information technology networks, but road networks (as we have been discussing), but also community networks, body networks. We know that this networks are becoming larger, wider, more complex. Complexity is key to our understanding of emergent warfare, to boundless warfare.

The applied technologies that make networks possible are fibre-optics, mobile batteries, processor size and speed, low orbit satellites. And us. We have become mechanised ourselves in the way that we seek to network our tasks. We tap in. Add on. Hack.

These technologies allow for applied tools such as UAVS/drones, information and cyber warfare, body monitoring, battle space visualisation systems.

**Known Unknowns**

Moore’s Law tells us that the number of transistors on a dense integrated circuit board will double every two years. History has shown the law to apt in anticipating processing power in the future. Having said this, even though we knew that processor speeds would increase in the future, we did not have an idea of what it would allow. Or at least most of us. As Chris Cooker has illustrated in his book *Warrior Geek*, Science Fiction is a rich source of how we might use technology in the future, though I doubt we will be using concentrated photon beams as swords in the future.

Processor speeds can allow greater artificial intelligence (whether like us or not), which in turn relies on autonomous decision making. The change in genetic and material sciences, micro-engineering also open up a world in bespoke, tailored, altered applications. Gene therapy is one thing. Gene warfare is another altogether. It feels as if we are on the birth of a new kind of molecular science or
sciences that will allow us to interact with physical world in a totally different way. Revolutions bring changes which are valueless for the revolution itself.

**Unknown unknowns**

And then, we are at a loss to anticipate those technologies on whose science has yet to be discovered or engineered. We know that techno-scientific changes have a tendency to support existing networks rather than provide new ones. At the same time, new technologies provide new problems that we did not know existed yet. These are questions and answers that are not in our current reality.

**Unknown knowns (Zizek)**

The significance of technology, its role in society and the way that technology can be used to enforce and project power brings to mind Zizek’s ‘Unknown knowns’. They are known, but this knowledge is guarded, invisible. We know about lasers in theory. We are not all aware of lasers in practice. The Chinese military has been working on what has been referred to as the ‘assassin’s mace’ or a trump card to outwit/defeat superior forces. It is a Unknown knowns. With over 4 million people in the United States with some level of classified access, we can see the role that unknown knowns play in society.

Here, I rely on Ruth Miller’s conceptual framework to define boundless warfare. We can understand boundless warfare interacting between three scales. They are scales of vitality, mobility and liberty.

*Vitality* refers to the living and the not living. Where does agency or responsibility come into play as software, hardware or more importantly wetware, as human and computer computation converges.

*Mobility* refers to the moving or stationary. One enjoys space, the other defeats it. Miller writes about the role of the UAV or drone in violating Cartesian lines such borders and boundaries while at the same time prized for their immobility. They can sit, watch, kill. Tornados and F-35Bs (or Joint Strike Fighters) cannot do this. Stuxnet was similar. It was unleashed but stationary. It was not sent. It was there. Waiting. Waiting for someone to plug it in to a Reactor machine. Mobility allows us to understand the spatial dimensions.

*Liberty* refers to how power is displayed whether hierarchical or vertical. If technology is controlled, we can understand its use by organised, nation-states and their militaries. This is something like the world we live in now. We can also think about the vertical display of power where individuals have the ability to have agency, to take responsibility. The prospect of linked (and as we have seen unlinked) computers mean that the boundaries on a map become less relevant.

**Challenges**

*What role for states?*

Where do states fit into a boundless system? They are bounded systems. Firstly, we must admit that bounded warfare is unlikely to disappear. We have an
interest in maintaining bounded systems. At the same time, technologies challenge whom has power, agency and responsibility. At the same time, how will societies be able to deal with less defined wars? Wars that have no end, or wars that have no enemy, wars that have no place. How does this interact with citizenship? Political support? Identities?

**What future for power and security (arms control)?**

As the potential for boundless warfare increases, what does this mean for arms control? Arms control relies on the state control of weapons, of the use of force. Would an arms control agreement on cyber make a difference to cyber attacks? We are at era of stalled arms control? I have argued before that we are at the end of an era of arms control. The interest is missing because the disparity is great. But could it be that the ability is missing too? In cyber? In bio-chem? In robotics?

Finally, *how does it shape the relationship between security and defence?* Militaries complain that that the convergence of security and defence makes their job more difficult because it thins out what they can do well with issues that are shared by other agencies or departments, and things that they do less well. Yet, many have documented that security and defence are increasingly interlinked. Not only does one lead to another, like civil war and famine, but boundless warfare suggests that as power, agency and responsibility changes while space, time and force changes, security and defence could really become one in the same. That is a problem for militaries for sure.

But it poses a problem, as I suggest here for all of us in terms of coming to terms with what technology means for society and how it influences the future of warfare, bounded and boundless.

My research is trying to look at these changes in two different ways.

The first is a project funded by the Economic and Social Research Council that looks at technology as factor in defence reform in relation to other factors such as combat experience, budgets and alliances. We are looking at 8 European militaries in terms of changes in assets, force structure and deployments.

The second project is funded by the ESRC and the Defence Science and Technology Laboratory that looks at bio-chemical security and asks the question of how to govern new challenges to incapacitants, pharmaceuticals, neurology and genetics.

Together these projects try to chart how the character and nature of war is changing.

These projects are part of the new Centre for War and Technology that we are establishing here at the University of Bath. As technological and social changes, as well as developments in strategic thought, are driving forces that perpetually transform the problems states confront and the opportunities to resolve them. The University of Bath’s Centre for Technology, War, and Society (C-WST) is a response to the need to promote understanding of conflict at their nexus.
Thank you