VICTORS AND VICTIMS
Creating a Military for the Digital Age

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General Sir Richard Barrons served as Commander Joint Forces Command, one of the six 'Chiefs of Staff' leading the UK Armed Forces until April 2016. He was responsible for 23000 people worldwide and a budget of £4.3Bn, delivering intelligence, Special Forces, operational command and control, all surveillance, reconnaissance and information systems and communications, operational logistics, medical support, and advanced education and training across the Armed Forces. An artillery officer, his military career included leadership from Captain to General on military operations in Bosnia, Kosovo, Northern Ireland, Iraq and Afghanistan – often as part of US-led coalitions and in NATO. He is President and Colonel Commandant of the Honourable Artillery Company, a Senior Associate Fellow at RUSI, and a Visiting Senior Fellow at LSE IDEAS.

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Modern military capabilities aren't the first thing that many people living in the UK or many European countries think about when they wake up in the morning. But it's becoming increasingly clear that we really must think about how they could bring great harm to our homeland and our vital interests abroad.

The comfortable lived experience of the past 25 years since the Cold War ended is just not guaranteed to continue. Modern nuclear and, perhaps more importantly, conventional military capability is changing the security paradigm we have grown used to and – wrongly –assume really is going to last forever.

This is not to suggest that this risk is either imminent or unavoidable. There is no script here, but we do need to recognise how things are changing. We should then resolve to do something about it, or knowingly decide to live our lives beholden to the continued benevolence of others with whom we are not on the best of terms.

RISK AND WAR IN THE DIGITAL AGE

We should not be surprised by this change in risk. Throughout human history war has been an enduring feature, and this means war in its elemental form: inherently unrestrained, brutal, tragically destructive of people and habitats, and fundamentally resilient to being tamed despite the best efforts of good people over the centuries. The existential fear of war and invasion that was familiar to our grandparents may not have troubled many in Europe since 1990, but it is still an everyday feature of life for hundreds of millions of people around the world today.

Just as significantly, although the essential nature of war never changes, ***how*** it is conducted changes continually as ideas and technology provide new ways of threatening or using violence. The bow and arrow gave way to the musket, the castle was defeated by the cannon, and the battleship was sunk by the aeroplane. Today, new combinations of large scale cyber capability, conventional precision ballistic and cruise missiles from very long range, and advances in air, space, maritime, and land capability mean we are at another turning point – although it is more of a process than a point.

We will understand this better when we look back at some future time, but it would be better if this was with the contented smile of a country that had sensibly transformed its defences, not through a veil of tears and blood amidst smoking ruins. So we need to look hard at how and why things really are becoming so different, then we need a structured debate about what to do about it, and then do it.

This Strategic Update is about setting out some common principles to guide that debate and the surrounding policy issues.

STARTING THE DEBATE

We should start by recognising that the big military platforms like ships, installations like airfields, and large formations of armoured vehicles that have embodied conventional capability since the middle of the last century are now being eclipsed by the ability to see and strike with precision from very long range. Modern conventional war can still be about the ferocious destruction of people and habitat at scale by unrestrained firepower, as seen in Aleppo. But it can also be about bringing the daily life of an opponent's society to a halt by interfering with or destroying the infrastructure that sustains it. This could include crushing the fundamentals of that society such as government, tax, land, and medical information.

The focus on territorial invasion, with all the challenges of controlling what is invaded, is being supplanted by the ability to break the will of an opponent from long range - digitally, psychologically, and physically. And this does not require a lengthy period of capability creation and mobilisation. The '10 Year Rule' of the 20th century, where our capability is based on the assumption that we won't be at war in the next 10 years, no longer applies: cyber war happens at click speed and missiles cross the globe in less than an hour. The point is that a great deal of current military organisation is no longer the right fit for the potential military risks that may have to be met.

These changes in military capability are occurring at a time when the world, so far as Europe is concerned, is becoming a much less stable and peaceful place. The antagonistic relationship with Russia, the complicated turmoil in the Middle East,

the developing nuclear stand-off on the Korean peninsula, and the legion civil wars and humanitarian strife found in parts of Africa and Asia are all profoundly difficult situations that contain within them the seeds of major conflict.

As this is the 'Asian century', the 'Thucydides trap' of potential conflict between a declining US and a rising China may define the security context of our time. We might still be prepared to live with outmoded military capability if we felt we had a firm grip on a stable world, but in fact we must contend with the reality of new military technology being aimed against us in a much more risk-strewn world.

We need to find a way of restoring our defence and security from the present low-level of capability, a result of more than 25 years of post-Cold War decline in western defence investment, in a way that recognises how the world is changing and deals with the continuing process of change in military capability. This is not about trying to do discretionary intervention better, it is about being able to maintain essential defences and the ability to fight when it is unavoidably necessary.

Fortunately, there is a good way forward. As we recognise that the ways we live, work, and play are being changed by the effects of the Digital Age, it will clearly be the case that military capability can be transformed by combinations of disruptive innovation that will deter and if necessary defeat even the best inventories and methods of potential opponents.

PRINCIPLES FOR MILITARY CAPABILITY IN A DIGITAL AGE

This is about how data, processing power, connectivity, machine learning and artificial intelligence, robotics, unmanned and autonomous capability, nano-technology, synthetic biology, new materials, and much else can be combined to create wholly new ways of delivering defence and security effects.

This military transformation will be unusual in that disruptive technology and innovation is generally being led by the civilian organisations, where it is created by people who have no military ambitions or expertise. On the other hand, many military leaders and the officials they work alongside don't find it easy to follow advancements in 21st first century technology.

In addition, some of the issues posed by new technology, such as the ability to create autonomous lethal weapon systems, will demand a broader debate amongst civil society, government, lawyers, and philosophers. So a framework of principles is required that will help create a broad debate where a range of participants in defence transformation can build a common and successful approach. This debate must recognise as one of its principles that the race to transform military capability for

the digital age has already started – and there will be no prizes for turning up.

What might these principles include to get things started?

A Military Transformation led by Civil Technology

The first principle is that most of the answers will be found in the adoption or adaptation of technology that either already exists or will exist through innovation in civil society. This is where thought leadership in data, AI, robotics, and autonomy already exists. There is also a great deal of brilliance to be found amongst the scores of start-up companies looking to create their own niche in the Digital Age. It is essential that the Armed Forces tap into this expertise, so they can explain what problem they are trying to fix and understand the full potential of what is being created. There will be no affordable or competitive exclusively military route, except in a few specialist areas.

Transformation not Evolution

In some cases it may be appropriate to proceed incrementally and with caution, but this should not be the ambition. Despite the military's preference for making technology adjust to their standing ways of working and the comfort that may be found in 'digitising the analogue', the real winners will be those able to conceive, design, and implement transformative change. This may well mean cherished forms of organisation and equipment are consigned to the dustbin of history, but nothing lasts forever. If the objective is to create true operational advantage in a highly competitive environment, then the winners will likely be those who can break themselves apart to create brand-new, decisive capability.

Joint and Combined by Design

This transformation must mark the definitive break point with armed forces built by mere combination of what individual, national navies, armies, and air forces choose to offer. Armed Forces for the Digital Age must be designed top-down as coherent joint forces. European armed forces must also be designed from the beginning to be fully interoperable with allies and partners across government. This will ensure maximum synergy, efficiency, and effectiveness, removing all the frictions of trying to link up capability built around different assumptions and standards. It will also mean more assertive control of military force development by the governments that bankroll it on behalf of taxpayers.

Effects Before Platforms

Most modern Armed Forces retain a self-image founded upon the icons of conventional capability that can be traced back to at least the Second World War. Ships, tanks, and aircraft have only ever been a means to an end and in many cases their primacy is seriously challenged by technology that will defeat them at range - at far less cost, and much less risk. In considering the

transformation that is now required the analysis must start with what ***effect*** is required and not with how conventional platforms can be augmented or enhanced.

It may well be that much of the current inventory has at least a transitory role as part of a network of capability, but the standing presumptions about the centrality of platforms, layers of command, and people in large numbers must be challenged. If it is possible to separate complex weapons from reliance on complex platforms, and if it is possible to bring people out of harm's way and substitute machines for them, then this must be energetically explored.

A Process not an Event

The transformation that will now occur will not be a single cycle or event. As the potential of digital age technology and unfolds over this century at great pace and with great unpredictability, so too must armed forces find ways of never allowing their capability to stand still. It will be essential to mirror the scale and pace of change in the way that military capability and method changes. This will be particularly important in the way that the acquisition and support processes adapt. In many areas hardware and software may have a useful life closer to two years than 20 years, so armed forces are unlikely in future to field large identical fleets of equipment that remain in service for many years and are then all replaced once. A constantly evolving inventory of capability will become normal.

Control of the Digital Space before Land, Sea, and Air

Traditional military operations have generally focused on the imperative of creating freedom of action on land, at sea, and in the air. Whilst this will clearly remain important, as fast as military capability relies on combinations of digital age technology the ability to maintain sufficient access and control of the digital space will become pre-eminent. Commanders able to see, fire, manoeuvre, and support themselves in a highly charged uncontested environment will prevail. To do that they must be able to communicate, connect to surveillance and reconnaissance, distribute data, acquire targets, employ precision weapons, and do many other things that will not be possible if the digital space is denied to them. This will require some significant changes to military doctrine and process.

Cyber Protection

Although cyber defence and offence are already a familiar part of military thinking, in the future cyber protection will be a core and standing part of how capability is designed and employed. This means much more than protection of networks and data, it extends to organisation, processes, and perhaps above all culture to ensure that everything possible is done to protect the integrity of an operation's information capability – just as everything will be done interfere with an opponent's information capability. Cyber protection cannot be an afterthought or an accessory.

Autonomy is an Opportunity not a Demon

There is already considerable concern about the potential for lethal autonomous weapon systems to kill people without any human intervention. This legitimate concern should not, however, mean that all forms of autonomy are rejected.

There are already defensive weapon systems such as Close-in Air Defence guns that will operate autonomously if set to do so – and if not used in this way will fail to protect their owners. There are also the many surveillance devices in all environments that will operate fully autonomously for long periods of time.

Autonomy provides one way of reducing military manpower costs, removing people from danger, and increasing military effectiveness. But not least because of the uncertainty surrounding the development of AI, the creation of autonomous capability will require careful governance and assurance. Nonetheless, as other powers in the world with different values and interests will not feel so constrained, Western forces must be prepared to counter unfettered lethal autonomous weapon systems in the future.

CONCLUSION

It is now time to get this debate underway. It won't happen by itself and it will not thrive if it is conducted piecemeal or in isolated pockets. It requires governments to adopt a policy of transforming their militaries through disruptive innovation over time and to bring together their armed forces leaders, technology industry, defence industry, academia, lawyers and philosophers in a common undertaking. And it needs to happen at alliance level such as in NATO and the EU just as much as at national level.

Time is at a premium: this is a competition. Would someone like to start? ■

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In this Strategic Update, General Sir Richard Barrons warns that our military capabilities must be comprehensively rethought, or we will all be at risk. He sets out 8 principles for how to create an effective military for the digital age.

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