Army

E.G. Keogh Oration 2019

Professor Ian Morris

E.G. Keogh Visiting Chair in Land Warfare Studies

Serving our Nation

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The E.G. Keogh Visiting Chair in Land Warfare Studies

Colonel E.G. Keogh, MBE, ED (RL)
24 Apr 1899 – 9 Nov 1981

Colonel Eustace Graham Keogh was born at Rutherglen, Victoria on 24 Apr 1899. Colonel Keogh began his military career in 1916 as a driver in the 1st Australian Wireless Squadron and served in the Mesopotamia Campaign in World War I until hostilities ended. He resumed military service in the post-war AMF, first commissioning on 22 Nov 1924 in the 24th Battalion. Five years later, on 27 Sep 1928 Lieutenant E.G. Keogh was promoted to Captain. *Australian Army Order no. 314* of 31 Oct 1931 announced that Captain E.G. Keogh was the winner of the AMF Gold Medal Essay Competition (a competition he would win twice more), and four years later he was promoted to Major.

Following the outbreak: of World War II, Major Keogh was seconded from the CMF to the AIF on 17 Apr 1940 and appointed to the 2nd/24th Infantry Battalion with the rank of Captain. Captain Keogh was seconded to Headquarters 7th Australian Division, promoted to Major, and embarked with Divisional Headquarters in Oct 1940 for the Middle East. By the conclusion of hostilities in 1945, he had been promoted to Lieutenant Colonel and served as a Liaison Officer in the Middle East, General Staff Officer in Brisbane, Regulating Officer and Liaison Officer in New Guinea, and General Staff Officer at the Directorate of Military Training in Melbourne. Lieutenant Colonel Keogh was demobilized and transferred to the Reserve of Officers of the AMF on 2 May 1946, an occasion marked by a letter from the Chief of the. Australian General Staff, Lieutenant General V.A.H. Sturdee.

Lieutenant Colonel Keogh was shortly after found working at the Directorate of Military Training, only this time in a civil capacity as a Commonwealth Public Servant. His principal duty was to edit, publish, and arrange for the distribution of a publication called the *Army Training Memorandum*. The memorandum was discontinued in 1948, but was in effect re-organised

into a publication utilizing the same distribution in a different format; called the *Australian Army Journal*. Lieutenant Colonel Keogh was the first editor of the journal, which released its first issue in Jun-Jul 1948. In addition to his duties as editor, Lieutenant Colonel Keogh contributed articles to the journal and completed miscellaneous tasks such as the production of lectures and speeches. He also wrote for training purposes in the AMF (publishing several books through the Directorate of Military Training), and was the author of the biographical sketch of Field-Marshal Sir Thomas Blarney in the *English Dictionary of National Biography*. At some point during his time as editor, Lieutenant Colonel Keogh was also promoted to Colonel.

On 17 January 1957 Colonel Keogh was made a member of The Order of the British Empire – Member (Civil) in recognition of his outstanding public service.

Colonel Keogh reached the age of 65 years on 24 Apr 1964 and retired from the Commonwealth Public Service. However, despite this he persisted in his editorial role for the *Australian Army Journal* until issue no. 188 of Jan 1965. A letter from the Secretary of the Department of Army marked the occasion of Colonel Keogh's retirement:

> "After more than forty years of service to the Commonwealth, the time has come for you to step down into your well-earned retirement. May I express my sincere appreciation of the loyal and efficient service you have rendered so willingly during this period. As a Senior Staff Officer during the Second World War and as an officer of the Commonwealth Public Service you have at all times set a fine example of devotion to duty and service in the interest of the Commonwealth which has earned you the respect and admiration of all who have had the good fortune to be associated with you."

In retirement, Colonel Keogh remained active and was inducted into the Melbourne Legacy Club in Dec 1964. In 1971, Colonel Keogh was named the Honorary Colonel of the Ivanhoe Grammar School Cadet Corps, an· appointment he held for ten years. Colonel Keogh held the position of military advisor to the popular television production "The Sullivans", and also contributed a special article to issue no. 329 of *Australian Army Journal* in Oct 1976 (its last issue before being re-organised into the tri-Service *Defence Force Journal*) entitled "Birth of an Army Journal".

Colonel Keogh died at Heidelberg, Victoria on 9 Nov 1981 aged 82, after a short illness.

The Australian Army Journal

Colonel Keogh was the editor of the *Australian Army Journal* from issue no. 1 until issue no. 188 (Jun-Jul 1948 through Jan 1965).

The last issue of the *Australian Army Journal* was issue no. 329, published in Oct 1976. It was re organised into the *Defence Force Journal* following a restructure of the Navy, Army and Air Force into the Australian Defence Force.

The *Australian Army Journal* began publishing again with issue no. 1 in Jun 2003.

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Professor Ian Morris experiencing Australian Armour at 7 Brigade, Enoggera Queensland.

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Ian Morris

Ian Morris is a historian and archaeologist and holds Stanford's Jean and Rebecca Willard Professorship in Classics. In addition to his Stanford appointment, he is also a Senior Fellow of the IDEAS think tank at the London School of Economics, a Corresponding Fellow of the British Academy, a Senior Fellow of the Institute for Advanced Studies at the University of Toulouse, a Fellow of the Society of Antiquaries and the Royal Society for the Arts, a Contributing Editor at the strategic forecasting company Stratfor, and a member of the scientific advisory board of the Max Planck Institute.

He has excavated archaeological sites in Britain, Greece, and Italy, most recently as director of Stanford's dig at Monte Polizzo, a native Sicilian site from the age of Greek colonization. He began his career studying the rise of the Greek city-state, then moved on to ancient economics, and now works on global history since the Ice Age. He has published fourteen books. One of them, *Why the West Rules—For Now* (2010), has been translated into thirteen languages and has won a number of literary awards, including the 2011 PEN-USA prize for non-fiction. His most recent monograph, *Foragers, Farmers, and Fossil Fuels: How Human Values Evolve* (2015), has been translated into six languages, and he is currently writing a new book called *Fog in the Channel: Britain, Europe and the Wider World, 6000 BC-AD 2103*.

In addition to digging and writing, he regularly speaks to academic, business, government, and strategy groups, and in recent years has been the Roman Professor of International Studies at the London School of Economics, a visiting professor in the University of Zurich's Business School, and a Distinguished Visitor in the Sage Center for the Study of Mind at the University of California-Santa Barbara. At Stanford he has served as Chair of the Classics department, Director of the Archaeology Center, and Senior Associate Dean of Humanities and Sciences. His research fellowships include awards from the Guggenheim and Carnegie foundations and the National Geographic Society, and he has received two honorary doctorates and a Dean's Award for excellence in teaching.

Foreword

It was an enormous honour and pleasure to serve as the Australian Army's 2019 Keogh Lecturer, and the two weeks my wife and I spent in Brisbane, Canberra, Sydney and Townsville were consistently informative and fun. Even the weather was wonderful.

This opportunity to share my thoughts on future warfare and the 21st century's changing geostrategic landscape was very welcome, and I learned an enormous amount from discussions, both formal and informal. I would like to thank our genial hosts—Lindsay Adams, Lee Hayward and Al Palazzo—for making it all so enjoyable, and also Pete Connolly, who extended the initial invitation; and, of course, the Australian Defence Force's 3, 6 and 7 Brigades, Army History Unit, Forces Command and Special Operations Command, for their generosity and energy; the Australian Defence Force Academy, the Australian War Memorial, the Department of Foreign Affairs and Trade and the Office of National Intelligence; and the Australian National University, the University of Queensland and the Lowy Institute.

Best wishes to everyone, and good luck with your mission.

Ian Morris
Boulder Creek
California, USA
August 2019

What Are Armies For?

Introduction

I haven't spent much of my life around the armed forces. By background, I'm an archaeologist and historian. I've excavated sites in Britain, Greece and Italy, but at the outset I had no plans at all to go into military history. When I was starting out on my career, in the 1980s, there was a strong feeling among academics that anyone interested in the history of war or violence must be a warmongering monster—which is why military history is so little taught in Western universities today. When archaeologists dig up what looks like evidence of killing or violent destruction, they tend to bend over backwards to find other explanations for it, no matter how implausible these are; and when historians are confronted with descriptions of war and violence in ancient or medieval texts, they regularly dismiss them as stylistic devices or just plain fantasy, concluding that the people who wrote the texts didn't really mean what they said.

This is a big change from the early days of archaeology. In fact, when the field was originally getting established, between roughly the 1870s and the 1920s, its founding fathers were overwhelmingly military men. This made a lot of sense: in those days, no-one was offering degrees in archaeology, and military men had the organisational and logistical skills to put together large teams of people, sustain them at the ends of long lines of communication and keep them focused on strategic goals, despite all the frictions and distractions of daily life. The first giant in British archaeology, Mortimer Wheeler (1890–1976), in fact had certain things in common with the man we're honouring in these lectures: like Eustace G. Keogh, Wheeler had lied about his age so he could serve in the First World War, then served again in the Second. He was then plucked off the landing beach at Anzio in 1944 and sent to run all archaeology in India in the final years of the Raj.

By the 1980s, most archaeologists had conveniently forgotten this pedigree, although my PhD advisor, the great archaeologist Anthony Snodgrass (1934–), was an exception. He'd written his own PhD, published back in 1964, on *Early Greek Armour and Weapons*, and one of the things I learned from him is that if you want to understand the past, you must never overlook the realities of violence. This was particularly brought home for me about a dozen years ago, while I was writing my book *Why the West Rules—For Now*, published in 2010. My wife had read one of the draft chapters for me, and when I asked her what she thought of it, she said, 'Well, I liked it … but there was a lot of war'. This worried me: I hadn't thought that there was very much war in it at all. Was I overdoing the war? Was I getting the story wrong? Did I need to go back to the drawing board? When I thought about it, though, I realised that the reason there was a lot of war in the chapter was simply that there was a lot of war in history. So much so, in fact, that I decided then and there that my next book needed to be all about war. War, after all, touches on some of the biggest questions about humanity: What is the role of violence in our world? How can we control or even reduce it? Why has every complex society in history had an army? And, when we get right down to it, what are armies for?

These are very high-level questions, concerned with the entire planet and hundreds of thousands of years of history. When I sat down to write the book which appeared in 2014 as *War! What Is It Good For?* I therefore found myself painting a story in very broad brushstrokes, effectively giving us the view from 10,000 metres. But, that said, I think it's possible to offer answers to these questions, even if they have to remain tentative ones and are certain to be revised as historical methods and evidence improve. I also think these answers might be interesting to professionals in arms as well as academics.

Professor Ian Morris addressing Future Land Warfare Branch at Russell Offices.

Leviathan

My questions are very old ones, but the ways scholars think about them today effectively go back only as far as the English philosopher Thomas Hobbes. Reflecting in 1651 on the recently ended English Civil War, Hobbes came up with a general theory of the role of violence in society. When God first created mankind, he speculated, humanity's original condition was that 'every man is Enemy to every man'. 'Men live,' he continued, 'without other security, than what is their own strength … In such condition, there is no place for Industry'. He then provided a long list of things which simply couldn't be done in a world of pervasive violence, ending, famously, by saying that there were 'No Arts; no Letters; no Society; and, which is worst of all, continual fear, and danger of violent death; And the life of man, solitary, poor, nasty, brutish, and short'.

But don't panic, Hobbes advised his readers. A solution is at hand. He called the solution (and his whole book) *Leviathan*, after a famously scary Biblical monster in the Book of Job. What humanity needs, Hobbes concluded, is a monster as terrifying as Leviathan which will basically scare them straight; and luckily we do have just such monsters, in the form of the state. People need a king who has so much violence at his disposal that his subjects will be terrified to use violence in pursuit of their own ends, knowing that it will bring the monarch's monstrous wrath down on their heads. The masses will then renounce violence. Arts, Letters and Society will flourish, and lives will no longer be solitary, poor, nasty, brutish or short.

Hobbes's theory was massively controversial, and has been going in and out of fashion ever since the 1650s. When I was a student in the 1970s and 1980s it was very much out of fashion, but now it is gaining ground again. The reason for this is that we now have so much more evidence than Hobbes could ever have dreamed of, and it seems to point towards a startling conclusion: that people's chances of dying violently have indeed fallen dramatically across history.

A Safer World

This new finding rests on one of the core discoveries of 19th- and 20th-century archaeology and anthropology: that in the Stone Age, people lived in tiny bands. Before about 10,000 BC, everyone in the world lived in hunter-gatherer groups, surviving by hunting wild animals and gathering wild plants. This meant that population densities had to be very low (typically under one person per square kilometre) and people had to move around constantly as animals migrated and plants ripened.

There's a lot of scholarly argument over how safe it is to extrapolate from anthropologists' observations of societies still using Stone Age technologies in modern times (many of them made in 19th-century Australia) to interpret the stones and bones which archaeologists dig up. Most archaeologists agree, though, that Stone Age societies were very loosely

organised, with few institutions bigger than the family. This doesn't mean that Stone Age people were savages, constantly killing each other; but it does mean that when disputes escalated, there were few constraints if one party decided to get violent. The killing was almost always small scale, but it added up, and many scholars now think that something like 10 to 20 per cent of people in Stone Age societies died violently.

To get a sense of what this means, let us fast-forward to the 20th century. This saw two world wars, multiple genocides and the use of nuclear weapons. A staggering 100 million to 200 million people died violently—but something like 10 billion people lived during these hundred years. The 20th century's rate of violent death was roughly 1 to 2 per cent—*one-tenth* of what it was during the Stone Age. It seems like an astonishing paradox: despite inventing the worst weapons ever, and despite the civil wars and mass shootings which currently fill the headlines, the world has become *ten times safer* since the end of the Ice Age and keeps getting safer still (according to the World Health Organization, the global rate of violent death in the 2010s was just 0.7 per cent).

But when we think about what Hobbes said, we see that this is not a paradox at all. The more terrifying the weapons a Leviathan has, the better it can do its job of scaring people straight; so it makes complete sense that a nuclear-armed Leviathan should outperform a bronze-armed one. But this conclusion just confronts us with a new question: where do these Leviathans come from? The evidence of archaeology and anthropology seems to point to a clear but uncomfortable answer: that over the long term, by which I mean the 12,000 years since the end of the last Ice Age, Leviathans have been created by violence and have then driven down the rate of violence. Basically, the long-term picture is simultaneously optimistic (that violence has slowly been putting itself out of business) and pessimistic (that violence is a central part of the human story); but it is a story that we cannot just wish away.

Three Points

In this short essay, I want to draw three points out of my book *War! What Is It Good For?*

The first is its central claim: that in the long term, what has driven down rates of violent death has ultimately been war itself. By fighting 10,000 years of wars, people have created larger, more organised societies which have reduced the risk that their members will die violently. Let me be clear, though: this is not because the men who have created these larger societies through their violence (overwhelmingly, these masters of violence have been male) have been saintly seekers after the good of their subjects; it is because they have been cynical exploiters. What rulers want is quiet, well-behaved taxpayers who will work hard, hand over their profits and not try to settle every argument with a neighbour by killing him and burning his farm. Violent subjects are bad news for a ruler, so he will try to scare them straight.

Not all rulers are equally good at this, of course, and history is full of mad dictators like Hitler, Stalin, Mao or Idi Amin who were downright terrible at it; but we are never going to understand the patterns just by looking at these monsters. Over the ten-millennium long run, enough rulers have been good enough at pacification to cut rates of violent death by 90 per cent. It has taken 10,000 years, but we are ten times less likely to die violently than in the Stone Age.

My second point is that while everyone agrees that war is a terrible way to create these larger, safer societies, it nevertheless seems to be pretty much the only way we've found. This is a depressing proposition, but it's just really hard to find a convincing case of the creation of a bigger, stronger Leviathan which didn't involve large-scale violence. There are interesting cases we can argue over, such as the rise of the European Union—or, for that matter, the creation of the Australian Federation—but the big pattern seems to be that we humans hardly ever (maybe never) give up our right to settle our problems by force unless we're forced to by someone who has greater force at their disposal, or by our fear of such a Leviathan.

If this is right, then we have to conclude that war really has been good for *something*, and that that something has been the creation of larger, more organised societies which drive down rates of violent death. In the long run, in fact, war has been so good at this that the third claim I want to make is that violence is now on the verge of putting itself out of business.

This point, though, needs serious qualification. One way to interpret it might be to assume that what the world needs is one more great war, which will drive rates of violent death down to zero. But that, of course, is absurd: we are now so good at violence that such a war might destroy everyone. Although there are currently only about 4,000 nuclear warheads in the world, down nearly 95 per cent from the peak of 70,000 in 1986, the great powers could rapidly rebuild enough bombs to endanger all life on earth. Perhaps we should conclude that although violence *has* been self-defeating, that trend has now been reversed. Far from living in the safest age of humanity, we may be embarking upon the most dangerous.

The Historical Pattern

This 10,000-year story is full of twists and turns, but whether we are understanding it correctly ultimately depends on the quality of the evidence. Rates of violent death are difficult to calculate, especially when—as is the case through most of history—the data can only provide vague impressions of the statistics. We can make guesses about rates from what authors in the past said about violence, the frequency with which archaeologists find fortifications, or weapons in graves, and all kinds of equally slippery evidence. The best data, which will eventually provide us with enough detail to make solid quantitative estimates, come from people's actual skeletons, which preserve distinct traces of lethal trauma; but we

are still a long way from having big enough datasets to anchor the story firmly. As a result, most of my book is about the details of the evidence. Right now, though, I'll just cut to the chase.

I estimate that between about 10,000 BC and 1 BC, as the world moved from the age of hunter-gatherers to that of the great ancient empires, rates of violent death fell by something like three-quarters, from a figure in the 10 to 20 per cent range to one in the 2 to 5 per cent range. However, if the decline was actually less than this, say just to 5 to 10 per cent rather than 2 to 5 per cent, it still wouldn't make much difference to the overall argument: the important thing here is that as humans created the world's first Leviathans (which began in the Middle East around 3000 BC) and then made them bigger and stronger, rates of violent death came down. Even if they only fell by half rather than three-quarters, that would still be a momentous change. If, on the other, hand, rates of violent death actually fell even further than I'm suggesting, that would just strengthen the conclusion that war was 'productive'—in the specific sense of producing larger, safer societies.

By about AD 200, though, something very different was happening. War had turned 'counterproductive', in the sense of breaking these relatively large, safe empires down into smaller, more dangerous societies. The years between 200 and 1400 were, of course, the age of men like Attila the Hun, Genghis Khan and a string of other nomadic conquerors who rode out of central Asia to ravage the ancient empires which ran from China to the Mediterranean. Basically, the great empires' infantry armies couldn't compete with the mobility and archery of the steppe cavalrymen, and, with Leviathan now failing to protect them, imperial subjects stopped paying their taxes. Centralised armies and states simply disintegrated. Although not everyone in the world lived in this zone of failing empires, probably 75 to 85 per cent of all the humans alive did. I estimate (or, more accurately, guesstimate) that rates of violent death perhaps doubled during this 'Age of Migrations', from the ancient range of 2 to 5 per cent to a range in the 5 to 10 per cent area.

These trends were only reversed after 1400, thanks to a new technology which had been invented in China around 1100: the gun. Guns spread across the zone of agricultural empires faster than any invention had ever done, and between 1400 and 1700, infantry armed with muskets and cannons steadily reduced the steppe nomads' freedom of manoeuvre, reasserting Leviathan's power. Chinese and Russian troops did the heavy lifting in these wars, but the biggest winners were Western Europeans, who by 1600 had established a clear lead in firepower. They then multiplied this advantage by combining their new guns and tactics with new kinds of ships, which allowed them to project unprecedented military power on an increasingly global scale.

Between about 1415 and 1914, Europeans waged a 500-year war on the rest of the world. They created new, overseas Leviathans, such as Australia and the United States of America. They also linked the world together more tightly than ever before and, as they did so, rates of violent death collapsed. As we get closer to the present, the evidence gets better and better, and we can see clearly that rates of violent death, which had still been above

5 per cent in the 15th century, were below 3 per cent in the 19th and below 2 per cent in the 20th, and are now below 1 per cent in the 21st.

The picture we get, then, is that the history of violent death has gone through three phases. The first, lasting from about 10,000 to 1 BC, sees Leviathans getting bigger and stronger and rates coming down. The second, from AD 1 to 1400, sees Leviathans getting smaller and weaker and rates going back up; and the third, from 1400 to 2019 (and, let us hope, well beyond), sees Leviathans once again getting bigger and stronger and rates coming down. This pattern, combined with the details we see when we burrow into the evidence, has persuaded me that Leviathan drives the story.

Why We Fight

I could happily go on about the history all night, but the obvious question to ask next is: Why? Why has this happy story of falling rates of violent death been driven by an unhappy one of constant (albeit increasingly uncommon) fighting? To answer this, we need to think on an even larger scale, turning from long-term history to evolutionary biology, above all to the biological evolution of violence among our closest kin in the animal kingdom, the other great apes.

Hobbes of course knew nothing about this kind of evidence—but neither did biologists until about 60 years ago. It was only in 1960 that the primatologist Jane Goodall set up the world's first camp for studying apes in their natural rainforest habitat in Africa. What she found was shocking: she observed one group of chimpanzees waging a genocidal war on their neighbours, beating all the males to death and beating, raping and kidnapping most of the females.

Her findings have been as controversial as Hobbes's were 300 years earlier. However, most 21st-century biologists tend to think that her results—now replicated by dozens of other studies—show that violence is an evolved adaptation. What they mean by this is that almost every species of animals has evolved to be able to use violence to settle disputes. Each species has effectively evolved towards what biologists call an 'evolutionarily stable strategy' for using force—in plain English, the 'right' amount of violence.

Within any species of animals, no two individuals are exactly the same, just as no two members of our own species are identical. Each has its own ideas and instincts when it comes to fighting. Even among lions, there are some we might call pacifists, who use (relatively) less violence than is typical. However, a lion who is too peaceful will be less likely than the average lion to pass its genes on, because it will be chased off from food and mates. If it starves or does not have sex, its peaceful genes will not be represented in the next generation of lions. On the other hand, psychopathic lions who think that every problem can be solved by violence are also less likely than the average lion to pass on their genes, because every time they fight they run a risk of being injured, getting infected and dying. The

result: genes predisposing their bearers to be either too violent or not violent enough will drop out of the genome, and the species evolves towards the 'right' level of violence.

The same logic applies even to such peaceful species as doves—and to us. Humans evolved biologically around the edges of the central African forest, reaching something like our modern form between 300,000 and 60,000 years ago. During that time, our ancestors settled on an evolutionarily stable strategy which produced rates of violent death in the 10 to 15 per cent range (which is actually very similar to chimpanzees'). So we're exactly the same as every other species—except for the fact that we're completely different. Our biological evolution also gave us the miracle of nature: gigantic, fast-processing brains which make us capable of culture. Unlike any other animal, we can build up, share and pass on a cumulative and revisable body of knowledge about how to do things. Primatologists studying chimps have found that they behave in pretty much the same ways whether they live in Kenya or 5,000 kilometres away in Ivory Coast. Their behaviour only changes significantly if they evolve biologically into new species (which did happen across the last million years, as bonobo chimpanzees evolved south of the River Congo as a species with low rates of violent death, while regular chimpanzees evolved north of it with much higher rates of violent death).

Humans too are continuing to evolve biologically, but we also evolve culturally, choosing to change our behaviours to respond to our changing environments. When elephants migrated to the edge of Siberia, for instance, they came to a halt for many thousands of years, until they evolved into much furrier woolly mammoths; but when humans migrated to the edge of Siberia around 60,000 BC, instead of waiting to evolve into people whose hair was thicker, they changed their fashion sense, sewing together animal skins to make warm clothes.

No other animal can change its behaviour in this way to maximise payoffs, which is why we have been able to reduce our rates of violent death by 90 per cent across the last 10,000 years while remaining biologically basically the same animals. Our fighting produced Leviathans, and then made them stronger and stronger; and this in turn changed the costs and benefits of using force, deterring people from killing each other.

The bad news is that we cannot wish war out of existence, the way the famous song 'War' ('What is it good for?') urges us to do. The good news, though, is that we are very good at responding to changes in costs and benefits, and Leviathans have raised the costs and reduced the benefits of resorting to violence. This says something important about the profession of arms today. While armies obviously contribute to making the world a violent place, they are also part of the solution to the problem of violence. History shows that the real answer to the question of what armies are for is that the one thing which has reliably scared humanity straight and driven down rates of violent death is Leviathan and its armed forces.

The Most Dangerous Years in History

I will close with a few thoughts on what this answer might tell us about one of the biggest questions for anyone: whether we should expect another great war.

Before my digression on chimps, I left off my historical narrative at the point where Europeans were beginning to conquer the world. By 1815, Europe's wars had created a British Leviathan so strong that it could project power globally (historians in fact like to call it the first 'globocop'). As we might expect, the globocop drove rates of violent death down lower than ever before. Between 1815 and 1914, terrible wars were fought, but fewer than in earlier centuries. This was a terrible age for the victims of Leviathans, as the tragic histories of indigenous Australasia and America attest; but overall, the 19th century was the safest and richest the world had yet seen.

Rather than conquering the world, the British globocop oversaw a more peaceful international order by dominating flows of trade and money, using its navy and financial institutions to police a new intercontinental economy of open markets, migration and sea lanes, raising the costs of challenging this British order and increasing the benefits from cooperating with it. Unsurprisingly, most nations therefore chose to cooperate. As a result, Britain grew rich—but its trading partners grew richer still. British gross domestic product grew six-fold between 1815 and 1914, but Germany's grew nine-fold and the United States's more than forty-fold.

The 19th century was an economic triumph for Britain but a strategic disaster, because by the 1870s, Germany and the United States had grown rich enough to become rivals. Basically, the better the British globocop did its job of policing the international economic order and deterring anyone from overturning it violently, the harder its job became. In the 1870s, no-one had been foolish enough to challenge British hegemony head-on, but by the 1910s, that was no longer true. Britain could no longer afford to raise the potential costs of violence high enough to deter all challengers, and in 1914, Germany's leaders decided that war with Britain was no longer the worst of the options facing them. The results were two world wars, more than 100 million dead and the collapse of the British globocop.

Since 1945 (and even more so since 1989), the United States has created a similar worldwide economic system with itself at the centre. Americans have conquered far less of the world than Britain did, but have tied the planet together even more strongly by policing sea lanes and building an international order of free trade and movement. As happened with Britain in the 19th century, trade has made the new globocop rich (American GDP doubled between 1988 and 2018) but has made its trading partners richer still (Chinese GDP grew 6.5 times between 1988 and 2018). To some analysts, it appears that the American globocop has followed the British path of economic triumph combined with strategic disaster; and since the 2008 financial crisis, China has begun looking like a threatening rival.

In the 2000s only Saddam Hussein was crazy enough to challenge the American globocop head on but, if present trends continue, things might look very different 40 years on. By the 2040s, Chinese leaders—like Germany's in the 1910s—might feel that war with the United States is no longer the worst of the options facing them. This could potentially give us the worst of all possible worlds: geopolitics as unstable as those in the run-up to World War I, combined with weapons worse than those of the Cold War. The next 40 years promise to be the most dangerous in history.

If I am right that the past teaches us that peace depends on Leviathans, one conclusion seems obvious: everyone should be doing whatever they can to preserve a stable world order supervised by a competent globocop, which inevitably means the United States. Any challenge which produces a breakdown will quite possibly lead to a nuclear version of 1914.

But can we avoid such a breakdown forever? Here the answer is painfully obvious: No. Nothing lasts forever. Every nation eventually declines; every species eventually goes extinct. There is no reason to think we are any different.

Does that mean we're all doomed? Well, I have some thoughts on that too—but to see them, you'll have to read my book.

The Rise—and Fall?—of Modern Battle

Battle: An Unusual Event

When civilians like me think about armies, the first things which pop into our minds tend to be battles. Agincourt, Waterloo, Gallipoli, Stalingrad—these concentrated clashes of arms have come to stand in for the larger struggles of which they formed parts. Yet this is not, of course, the experience most soldiers have. My Uncle Fred, who served with the British Eighth Army in World War II, liked to say that he never saw a German or fired his rifle in the whole North African campaign. So far as he could tell, war consisted of jumping into lorries, being driven for days through the desert, jumping out in order to sit in a slit trench for several days more, then jumping back in the lorry and being returned to the starting point. His closest brush with danger, he said, was when he lost his false teeth in a sandstorm.

My point in this essay, though, is larger than Uncle Fred's: it is not just that battles are rare but that the kinds of battles armies nowadays fight have been *extremely* rare throughout history. Modern battle, I will suggest, did not exist until about 100 years ago, and battles of any kind only really began about 5,000 years ago. Before that date, such 'battles' as people fought bore more resemblance to sporting events than to D-Day. Why was this? And what does it tell us about where battle will go next?

Fighting itself is as old as humanity. That should hardly surprise us, since, as I mentioned in the previous essay, nearly all species of animals have evolved to be able to use violence to settle their disputes. What makes humans a bit unusual is that we have made fighting a social activity, cooperating in order to be able to fight in large groups. Ants and chimpanzees can also do this, but most species—think of cats, or eagles, or sharks—can't. But not even ants and chimps can match one other feature of our socialised warfare: our ability to *change* how we fight.

Looking back through history, there seem to be three main ways that humans have behaved when groups of them fight, which I'm going to call tribal, traditional and modern battle (even though tribal 'battle' isn't really much of a battle at all by traditional or modern standards). I'll say a few words about each, then draw out some thoughts about where modern battle might be heading next.

Tribal Battle

'Tribal' is a deliberately loose term, covering more than 95 per cent of our history, from the origin of modern humans (roughly 300,000 years ago) to the rise of the first states with formal governments (roughly 5,000 years ago). As I mentioned in my opening essay, these Stone Age societies were mostly very small-scale, living by hunting and gathering and moving round a lot—and also fighting a lot, producing rates of violent death of 10 to 15 per cent. Yet although they fought a lot, they did not really fight battles.

A certain amount of what we know about tribal battle comes from archaeological finds, including stone spearheads (which go back at least 160,000 years) and arrowheads (which go back 60,000 years), plus wounds on human skeletons. The most valuable information, though, has come from accounts of Stone Age societies which survived into recent times. Some of these accounts, like *The Life and Adventures of William Buckley*, a convict who escaped from custody in Australia in 1803 and spent 32 years living among the Wathaurung people, were written in the 19th century, but most, such as the detailed accounts of conflicts involving the Mae Enga people of Highlands New Guinea or the Yanomami and Waorani of the Orinoco and Amazon headwaters, come from the 20th. Most of them, though, describe rather similar behaviour.

When two groups of Stone Age people got into a dispute over something they thought important, one might challenge the other to what the Western observers labelled a 'battle'. Each group would send messengers to other groups which it considered its allies, inviting them to join it. Then, on the appointed day, the young men on each side would form into long, straggling lines facing each other at a predetermined spot. The two lines would stand just out of missile range (regardless of whether the local missile weapons were bows and arrows, stone-tipped javelins or just slingshots) and shout abuse at each other. Every so often, a handful of young men from one side would run out into no-man's land. They rarely ran all the way up to the enemy line but they might get quite close, to a range where missile weapons could do serious harm. They would then hold their ground as long as they dared, before running back to their own lines, to be congratulated by their fellows on their bravery.

The contest could easily go on all day and might then be resumed the following morning. However, if someone got seriously hurt—or even killed—fighting might well stop. If the fighters got hungry and had no food, they might also stop and wander off to find a meal. Or rain could stop play. Observers of this duelling in fact often likened it to cricket, and generally

came to the conclusion that tribal battle was in fact a ritualised contest very like a sporting event, allowing young men to show off their daring by running risks (but not too many). From this it was a short leap to the conclusion that Stone Age societies were not really very violent at all; and from there, only another short leap to the conclusion that prehistoric man had actually been very peaceful, and that war was an invention of modern (Western) societies.

These ideas began getting established among academics in the 1930s, and by the 1980s, when I began my graduate studies, archaeologists regularly dismissed evidence of violence in the distant past as the remains of ritualised conflicts in which very few actually got hurt. However, by that point the first evidence was emerging that this theory was mistaken. Early anthropologists, it was turning out, had been right to conclude that tribal 'battles' were quite like sporting events, but wrong to conclude that Stone Age societies were peaceful. The great problem with their work was that they just did not stay in the field long enough. If a hunter-gatherer band of 20 people suffered a 10 per cent rate of violent death, on average, only one person would get killed every 15 years. Early scholars, however, rarely stayed among Stone Age groups for 15 months, let alone 15 years. They were just not seeing the real violence.

That all changed in the 1970s, when the anthropologist Napoleon Chagnon began a series of long-term studies of the Yanomami of the Brazil-Venezuela borderlands. He was interested in genealogies, and soon realised that more than 20 per cent of Yanomami men seemed to have died violently. The longer he stayed, the more killings he witnessed. The real mayhem, Chagnon concluded, came not in the ritualised 'battles' but in a steady drip-drip-drip of ambushes and homicides.

Yanomami men had no interest in standing their ground in evenly matched face-to-face conflict on the battlefield. That would be very dangerous indeed. They were often very interested, though, in forming little bands to jump out on and kill individuals with whom they had arguments. In extreme cases, they would form war parties, creep through the forest overnight, hide outside an enemy camp until dawn, and then storm it just as its occupants were waking up, slaughtering everyone they could. As early as the 16th century, Spaniards settling the American Southwest were describing such massacres, and archaeological finds show that they go back much further. At Sacred Ridge in Colorado, for example, about 35 men, women and children were tortured and killed around AD 800. Their enemies used blunt weapons—clubs, or perhaps just rocks—to smash their feet and faces to pulp. The killers scalped everyone, cutting out tongues and hacking some corpses into dozens of pieces. They even killed the village dogs. And for some of the victims, this was not the first time they had been scalped: their skulls bore telltale marks from older, partially healed wounds.

Massacre sites of this kind go back to at least 11,000 BC, and there seems to be a consistent logic behind the violence. In small Stone Age societies, no-one can force anyone to fight. Going right up to enemies and fighting them one on one is scary and dangerous, and only a handful of braves will do it; but killing people whom you have taken by surprise, or whom you outnumber, is easy—so that is what Stone Age fighters do, waging savage,

dirty little wars of ambush and homicide. If they accidentally encounter groups bigger or more alert than they had expected, they simply run away and live to fight another day. The philosopher Thomas Hobbes, whom I mentioned in the previous essay, was right: this was a life of 'continual fear, and danger of violent death'.

Traditional Battle

This began to change about 5,000 to 6,000 years ago, in the Middle East. The last phase of the Ice Age had ended around 10,000 BC, and since then, population had been booming. Societies became more complex and hierarchical to cope with the greater numbers. Leaders emerged who became so powerful that their followers regularly concluded that they must be descendants of gods (or, in the extreme case of Egypt, that the pharaohs actually were gods incarnate). These great overlords created the world's first governments, with the power of life and death over their subjects. The new rulers amassed wealth beyond anything imaginable by Stone Age hunter-gatherers.

Wealth created new incentives for violence. By 3000 BC, a raid on an enemy settlement could do more than just avenge an insult or recapture kidnapped women: it could produce vast amounts of loot, plus slaves who could be put to work in agricultural fields. However, the bigger, richer governments of this new age were also sufficiently well-organised to protect their wealth against the threat of such attacks: they could dragoon their subjects into work gangs to build fortifications to keep enemies out. Men generally do not enjoy this kind of work, but their kings deployed a powerful argument: discipline. Subjects who did not obey could be punished, even executed. So effective did this prove that by 3100 BC the city of Uruk in what we now call southern Iraq had a mudbrick wall nearly 10 metres high and 10 kilometres long.

Obviously, though, societies which were sufficiently organised to build such walls were also sufficiently organised to besiege them, whether by climbing up ladders or siege mounds to get over the walls, by breaking them down with battering rams and tunnels or by starving the defenders into submission. Sieges were terrible things—and some of the world's earliest surviving poetry (again from Iraq) describes them in horrible detail—so defenders came up with another obvious tactic: march out and destroy the enemy force before it even gets to the city.

Thus was born traditional battle. Its goal was entirely different from the ritualised tribal battles: it was to destroy an enemy's capacity to project force. This called for entirely different kinds of men from the Stone Age's warriors—it needed true soldiers, men who would march right up to enemies who were carrying deadly weapons (by 3000 BC, bronze spearheads were replacing stone), stand their ground and kill until the enemy turned and fled. This required discipline, training soldiers to fight and manoeuvre in organised ways, and

punishing them if they just ran away. Armies needed the kinds of men who would rather die than disgrace their regiments, and they got them.

We see them for the first time on a carving known as the 'Vulture Stele', dating from around 2450 BC and found at the city of Lagash in Iraq. It shows serried ranks of soldiers carrying large shields and heavy spears and following an officer as he advances over heaps of enemy dead. But well before then, weapons found in graves in the Middle East had begun shifting away from arrows and javelins towards big bronze daggers and thrusting spears, and the first bronze armour appeared. In tribal societies, battles had been sporting events; now they were deadly killing fields which produced decisive results. Over time, the armies got bigger, more complex and more sophisticated, and by about 250 BC, generals in China, India and the Mediterranean were commanding forces 200,000 strong, equipped with mass-produced iron weapons.

Every region had its own version of this (there were war elephants in India, chariots and cavalry near the horse-rearing steppes of central Asia), but all shared in two trends. The first was the increasing importance of command and control. In traditional battle, leadership was about more than just bravery. It involved staff work, logistics, strategy and tactics. Generals had to figure out what was happening on huge battlefields, holding back reserves and committing them at the right time and place. Above all, they had to persuade their men to stand their ground as long as possible, because this, rather than sheer numbers, was usually what counted. Traditional battles could be bloodbaths, and even the best-disciplined army would typically break and run if one-third of its men fell (generally 10 per cent dead, 20 per cent wounded). There were exceptions, of course, like the Battle of Thermopylae in 480 BC, where the 300 Spartans really did fight to the last man; but victory usually went to the general who could inspire his troops to stand against one last charge, or who had held back one last reserve for a final push.

The second big trend was pursuit. No longer was it enough to see the enemy run away; the point of battle was to destroy the enemy's ability to fight, which meant pursuing the fleeing foe until all their organisation was shattered, leaving the victor complete strategic freedom of manoeuvre. Fast-moving light troops were therefore needed. By 1700 BC, Middle Eastern empires were employing chariots in this role, and by 900 BC true cavalry were replacing them. From then until then age of Napoleon, cavalry pursuit would turn tactical, battlefield victories into strategic, war-winning ones.

Modern Battle

Traditional battle has only been replaced in the last 100 years. Already by 350 years ago, armies in Europe, the Middle East, India and China were getting so big that traditional tools of command and control had a hard time keeping them together, and the genius of men like Marlborough and Napoleon lay largely in the solutions they came up with. But by 1914,

traditional battle had hit a wall. Armies now had millions of men, and battles spread across dozens of kilometres. Generals simply had no idea what was going on. Winning tactical victories was getting difficult, and turning them into strategic ones through pursuit was becoming impossible.

This, more than barbed wire, trenches or machine guns, was what turned the First World War into such a quagmire. Armies could, and regularly did, break through enemy lines; but there was no way for their commanders to exploit these advances, because they did not know where they were happening. Defenders simply deployed in depth, rushing forward reserves to counterattack every time a breakthrough threatened, while the offensive force could only bludgeon away across a broad front, suffering enormous casualties in attacks which were often pointless. By the summer of 1917, traditional discipline was breaking down. French divisions mutinied; the Russian army began going home. When officers shot deserters, the deserters turned into revolutionaries.

Something had to be done, and Germany did it first. If top-down, traditional command and control was no longer working, German officers reasoned, they must substitute bottom-up, modern initiative. They called their new thinking *Auftragstaktik*, 'mission tactics': generals would set general strategic and operational goals and then leave the soldiers to get on with figuring out how to achieve them. Traditional battles would dissolve into countless small actions as squads of a few well-trained *Stosstruppen* ('storm troops') would identify and infiltrate weak points in the enemy defences. Like Stone Age fighters, they would avoid large concentrations of enemy troops; but unlike Stone Age fighters, they would then go on the hunt for enemy command posts, which they would then attack and destroy. Ideally, enemy soldiers would only realise that the battle was on when they heard shooting coming from *behind* them; and, demoralised and surrounded, they would then surrender.

Although certain elements of this fluid, modern battle paralleled tribal battle, modern soldiers were nothing like tribal warriors. They were a new kind of man, just as traditional soldiers had been. These new men needed to be patriotic and have a personal commitment to victory. They also needed to be educated enough to read plans and understand their point, and to be independent-minded enough to show initiative. They had to be able to obey orders but also to know when to go beyond them. Fortunately, these were just the kinds of men being produced by modern, industrialised nation-states: democratic citizens who loved their country, rather than uneducated peasants who had no idea what they were fighting for.

The German army was already experimenting with new kinds of assault groups in 1915. When it finally unleashed them on the Russians at Riga in September 1917, the Russians ran away. The next month, 250,000 Italians surrendered at Caporetto and the front line lurched forwards nearly 100 kilometres. When the Germans tried again on the all-important Western front, in the spring of 1918, the British Fifth Army disintegrated. In the end the Allied line held, with Australian troops playing a distinguished part in stiffening it. But by 1939, the German Wehrmacht had perfected modern battle, combining *Stosstruppen* with tanks and aircraft to wage what journalists labelled 'Blitzkrieg'. Battle had become a matter

of unleashing chaos, betting on the enemy's organisation breaking down under the strain before your own did. It worked in Poland in 1939 and France in 1940, and nearly worked in Russia in 1941 and 1942, but by then the Allies had learned to use Blitzkrieg too. It was still the order of the day in 2003, when the American-led alliance overran the ancient battlefields of Iraq.

Future Battle

But what next? If history shows anything, it is that nothing is permanent. Battles, in the sense of attempts to seek decisive victory by destroying the enemy's armed forces, have only existed for 5,000 years, or less than 2 per cent of humanity's history; modern battles, relying on infiltration and initiative, have only been around for 100 years, or 0.03 per cent of the story. As technology and society change, so will the face of battle.

One possibility is that battles will continue to be important and will just become *more* modern, more reliant on highly educated, computer-savvy soldiers and above all on flexible special forces. Even the Russian army, long the last bastion of 20th-century mass and firepower, has been modernising since 2007, replacing its armoured divisions with brigade-sized combat teams and encouraging flexibility. In some ways, a computerised battlefield on which information is the most important ammunition seems like a logical endpoint of *Auftragstaktik*.

The strategist George Friedman, who founded the strategic forecasting company Stratfor (for which I write a monthly column) suggested in his 2009 book *The Next 100 Years* that future wars will be global but not total. What he meant by this was that they will draw in the entire planet but will not see any 20th-century style total mobilisation of societies for the war effort, with the conscription of millions of combatants and governments taking over entire industries. Rather, he foresees wars beginning with massive but brief cyber and space struggles, as competing nations attempt to destroy their rivals' ability to manipulate information. He then anticipates battles between largely autonomous armies, navies and air forces. The side which wins the cyber/space battles and dominates the information environment will inevitably win the air, sea and land battles too; and the side which loses will quickly capitulate, since its humans will have no further defence against nuclear and biological blackmail. The wars and battles will be short and relatively bloodless, leading to negotiated peace rather than unconditional surrender.

We will hopefully never find out if he is right, but the historical record suggests that this might be overoptimistic. There have been plenty of revolutions in military affairs in the past, when one arm of warfighting achieved such battlefield dominance that having an advantage in it pretty much guaranteed victory (such as chariots in the Middle East in the 2nd millennium BC, cavalry in medieval Europe and arguably air forces since 1940). Yet even though infantry and civilians stood little or no chance if the enemy won the chariot, cavalry or air contests,

wars rarely ended with a gentlemanly, negotiated surrender. More often, the victorious chariot, cavalry or air force went on to massacre its defenceless opponents.

Hypermodern battles will not necessarily be clean, surgical solutions. More likely, I suspect, they will be just one aspect of frenzied, massively violent attacks, even bloodier than the 20th-century world wars. They might begin not with neat clashes of algorithms but with all-out combined cyber, space, robotic, chemical and nuclear onslaughts, hurled against the enemy's digital and antimissile shields like futuristic broadswords smashing at a suit of armour. And when the armour cracks, as it inevitably will, storms of fire, radiation and disease will pour through onto the exposed bodies on the other side. Quite possibly, as in so many battles in the past, neither side will be sure whether it is winning or losing until disaster overtakes it or the enemy—or both at once.

But there is another possibility too. If future war becomes postmodern rather than merely hypermodern, battle might once more return to the relative insignificance it had in tribal war. Some analysts think this is already happening: after all, there have been few decisive battles since nuclear weapons came into the world in 1945. During the Cold War, battles might be locally decisive, but even victories as apparently complete as Israel's in 1967 or North Vietnam's in 1975 actually took place in the shadow of the great-power nuclear confrontation. The outcomes of the Six-Day and Vietnam Wars were negotiated against the backdrop of potential annihilation. An actual decisive battle on the world stage, with Soviet tanks rushing through the Fulda Gap and across the North German Plain, was perhaps never really very likely.

Although the Cold War's binary Soviet-American confrontation is over and the number of nuclear warheads has fallen by 95 per cent, enough weapons of mass destruction survive that battle will perhaps never again settle a great-power dispute. Rather than augmenting battlefield power, our cyber, nano- and space weapons might just provide more ways to compete without ever reaching a decisive battle, allowing governments to pressure rivals without running any risk of escalating to truly decisive, but disastrous for all, nuclear battles.

Only time will tell whether 21st-century battle will be bloodless, horrific or irrelevant. In the end, perhaps, only one thing seems certain: that battle will change its forms and functions faster in the 21st century than ever before.

Five Thousand Years of Irregular Warfare

In the beginning, all warfare was irregular, in the sense that it was waged through ambushes, raids and murders. For tens of thousands of years there was no distinction between soldiers and civilians, because there were no such things as soldiers—just young men who might, or might not, decide to fight. As we saw in the previous essay, only since about 3000 or 2500 BC have regular armies existed, against whose formal battles and sieges the looser activities of irregular forces can be defined.

The coming of regular warfare did not drive irregular forms into extinction though. At most, irregular conflict migrated into a twilight zone, where it offered poor, small and weak societies a way to fight back against regular forces, or gave rich states with regular armies of their own ways to extend their wars. This, in fact, is the key to what we normally nowadays call irregular warfare: an asymmetric struggle between regular and irregular forces, in which the two sides often have entirely different aims and definitions of victory.

In the 5,000 years in which regular armies have been fighting irregulars, they have learned many lessons; but whenever they have not been fighting such wars, they have tended to forget them again. The lessons then have to be relearned, often at a high price, over and over again. This alone makes it worth taking a look at what the past can teach us about irregular war.

Ancient China: Learning from Irregular Enemies

Regular armies originally grew out of irregular ones, because disciplined forces made it easier to besiege cities and win battles against enemies who tried to stop you from doing this. The rise of regular armies, though, tended to produce the kind of paradox that is typical in military affairs. The stronger state A's regular forces become, the more states B, C and D need to go regular too; and the more B, C and D fight conventional battles, the more A gains by making its forces even more disciplined and organised. But at a certain point, which is

never easy to foresee, this system of conventional fighting becomes so rigid, predictable and geared towards fighting peer forces that new opportunities arise for irregulars, and society E might find—particularly if it is smaller and poorer than A, B, C and D—that it fares better by sticking with irregular forces than by copying its disciplined neighbours.

We see this cycle over and over again in history. In what we now call Iraq, the world's first regular armies were operating by 2500 BC, and by 2300 had created a huge Akkadian Empire, stretching from the Persian Gulf to the Mediterranean. But by 2200, Akkad's armies were running into trouble trying to fight irregular enemies, whom they called Amorites. Raiding out of the desert, these Amorites plundered Akkadian cities. We see it again with Rome, which built huge conventional armies in the late 1st millennium BC to fight equally conventional Greek and Carthaginian rivals—only to find in the first few centuries AD that they needed something entirely different to fight irregular rivals raiding out of the German forests.

The most instructive example, though, comes from ancient China. Starting before 600 BC, dozens of warring states competed ferociously, raising bigger and bigger conventional infantry armies until, in 221 BC, the First Emperor of Qin overthrew his last rival. Almost immediately, though, Qin armies ran into a problem along their northern frontier, where China's cultivated lands met the arid steppe grasslands. The mounted nomads who lived on the steppes were not very numerous but they were extremely mobile, and Qin armies found it very difficult to stop them from riding in, plundering villages and galloping off again with booty and slaves. When Chinese troops pursued the nomads onto the steppes, the infantry invaders ended up being lured deep into the wastelands and perishing from thirst.

Modern armies pride themselves on being learning institutions, and ancient armies could be just as effective. The soldiers of China's Qin dynasty and of the Han dynasty which succeeded it in 206 BC quickly worked out, by trial and error, a suite of responses to irregular challenges; and although 2,000 years have now passed, no-one has really added to the list which they drew up.

Their responses addressed the tactical, operational and strategic levels. So far as tactics went, they immediately saw that their own armies needed to build irregular arms if they were to fight back. On the steppes around 200 BC, that meant above all cavalry, which they recruited either by hiring steppe nomads as mercenaries or by raising their own horses and training to use them efficiently. Ideally, they would fight pitched battles against the raiders and destroy their capacity to raid. Unfortunately, the enemy rarely agreed to stand and fight, so China's cavalry forces just copied what the irregulars did themselves—raiding to burn villages or slaughter enemy horses and cattle. No sense of military honour was allowed to rule out any tactic which worked; one of the earliest stories about defeating irregular cavalry, which comes from the Greek historian Herodotus and describes events around 600 BC, tells of inviting nomad leaders to a feast, getting them drunk and murdering them.

At the operational level, Chinese leaders (and Persian kings too, for that matter) realised that the reason regular forces were so ineffective against raiders was that the regulars could not force the irregulars to stand and fight a pitched battle. So, Chinese generals reasoned, they needed to identify some decisive resource which the nomads would simply have to defend when it was threatened. On the steppes, that meant springs and oases, which were few and far between; so, between 130 and 100 BC, China built up enormous cavalry armies to wage pre-emptive war by seizing the nomads' water holes and then defeating the forces which came to take them back.

Han cavalry armies won huge victories in this way, but the problem with pre-emptive war soon became apparent: it was very, very expensive. Taxes rose and rose, generating unrest around the empire. Military thinkers therefore came up with a Plan B: containment. The first Great Wall of China was built as early as 210 BC, and it was constantly upgraded to defend cultivated agricultural land from the steppe raiders. Chinese rulers quickly saw that walls could not actually stop incursions but could channel nomads' movements in ways which made them a bit easier to control, even if at the end of the day nomads could always find a way through or around the defences.

A Plan C was obviously needed, which took a very different form: diplomacy. China had enormous soft power, and many of the nomad princes really wanted to live like Chinese elites, so the Han court sent them gifts of silk, wine and, in really important cases, princesses. The idea was to make nomad chiefs like China and to feel that they had more to gain from working with it than from fighting against it. Sometimes it worked: marriage alliances gave chiefs a stake in the Chinese dynasty's success and elevated them above their rivals, sometimes even leading to the breakdown of threatening-looking steppe federations.

By far the most successful tool was straightforward bribery. The logic here was harsh but simple: nomad raids hurt the empire because burning villages and kidnapping peasants prevented border populations from paying their taxes. Pre-emptive war, wall-building and diplomacy could all reduce this, but all were expensive; so why not calculate how much the raids were costing and then offer the nomad chiefs a slightly smaller sum to stay home and not raid (or, better still, to raid other chiefs)? This worked better than most methods but still had its limits. There is a saying in Chicago that an honest politician is one who, when you buy him, stays bought; but steppe chiefs rarely rose to Chicago's standards and regularly took Chinese money but then raided anyway.

Finally, Chinese leaders also identified the range of possible strategic goals. There were basically just three: to destroy the nomad population, killing or enslaving so many of its members that they could not raid anymore; to define down victory and learn to live with the constant background noise of intermittent terror; or some combination of these two options.

How to Win Irregular Wars

No government, whether in ancient China or anywhere else, has ever really figured out the perfect way to win irregular wars. All have ended up mixing and matching different elements from the list of tactics, operations and strategies identified 2,000 years ago in China, usually combining the carrot and the stick. Overwhelmingly, though, they ended up defining victory down and making sordid political deals with enemies previously condemned as murderers. These deals can be dressed up in high-flown rhetoric, as were the Good Friday Accords which ended the Northern Ireland 'troubles' in 1998, but these negotiated compromises always involve governments giving up some of what they want.

Governments do not have to do this, though. Much of the time, governments can see ways to destroy the irregular forces altogether, but conclude that the price is too high to pay. As an extreme case, we might take the United States's various counterinsurgency campaigns since 1945. In every case, the United States could have eliminated the insurgents completely by blasting their countries with nuclear weapons—but the moral, political and military cost of doing so was too high for anyone to consider it seriously.

Sometimes, though, governments weigh the costs and benefits of rooting out irregular resistance and decide that annihilation is worth the cost. One of the most informative cases is that of pirates. Piracy and banditry are old as trade itself, but expanded enormously in the 16th century as the volume and value of long-distance commerce increased. As soon as merchant vessels were out of sight of land, laws ceased to be enforceable, and heavily armed pirate ships soon infested numerous regions of the Atlantic Ocean and the Mediterranean and East China Seas. The drain they imposed on national economies was serious, and officials in Spain, France, the Netherlands, Britain, Turkey, Persia, India and China alike implemented the same kinds of tactics, operations and strategies which ancient China had used against steppe nomads. Merchants armed their own ships and fought back; some countries adopted convoys; patrols were launched and forts built to contain pirates; diplomacy and bribery were deployed to buy pirates off; and, when things got really bad, governments would launch pre-emptive wars. In the 1560s, Spain, Turkey and China independently launched operations which collectively added up to a kind of global war on piracy. In 1575, Spanish and Chinese ships even cooperated against buccaneers operating in the Philippines. By 1580, all these governments were concluding that they had reduced piracy to the level of a nuisance, which could now be safely ignored.

What blew the lid off this arrangement was that, one after another, European governments commissioned pirates as irregulars in their own navies, giving them legal title to keep anything they stole from foreign merchants (minus a commission which went to the monarch who had issued their 'letters of marque'). These 'privateers'—a much more dignified title than 'pirates'—flourished; some, like Walter Raleigh and Francis Drake, even became national heroes. But when the wars they had been recruited to fight in ended and they were

thrown out of work, many went back into private practice—but now on a much larger scale than before.

Right through the 17th century, governments continued trying to buy off pirates rather than to exterminate them. In 1671, for instance, the privateer Captain Morgan ignored the fact that England had just signed a peace treaty with Spain and went ahead and sacked several Spanish cities in the Caribbean anyway. Rather than killing him, though, King Charles II decided that it would be much cheaper to knight him and make him governor of Jamaica. However, by 1701, England's rulers had decided that piracy had now reached such a level that it had to be destroyed, and that the massive costs involved were worth paying. That year, when Captain Kidd seized several English ships in the Caribbean, he found himself hunted down, shipped off to London and put on trial. Spending his last shilling on rum, he was dragged to the gallows roaring 'I am the innocentest person of all!', only for the hangman's rope to break. At one time, that would certainly have been taken as a sign that he should be pardoned, but not now. A second rope did the trick.

Kidd was just the beginning. Through the 1710s, specially recruited naval squadrons pursued pirates across the Caribbean and up the North American coast, eventually catching up with the most notorious of all, Blackbeard (Edward Teach) in 1718. Blackbeard proved even harder to kill than Captain Kidd, absorbing five musketballs and 25 sword strokes before finally being beheaded, but the golden age of piracy ended with him. In 1718, pirates had launched 50 raids in the Caribbean; in 1726, there were just six. When states get serious about defeating insurgents, they can usually do it—but only at tremendous cost.

How to Lose Irregular Wars

One of the main reasons why irregular wars are so expensive to win is that irregular armies, just like regular ones, are learning institutions. Effective irregular generals study their enemies, working out ways to exploit their weaknesses, and they constantly update this knowledge.

The irregulars who overran the Roman Empire in the 4th and 5th centuries AD are a classic example. 'Keep peace with walls', the king of the Goths had advised his followers after they destroyed Rome's main field armies in 378, his point being that the Goths had no capacity for siege warfare. By the 440s, though, Attila the Hun had learned to solve this problem, spending lavishly to recruit Roman military engineers who made it possible for him to storm most of the major fortresses in the Balkans. The Mongol warlord Genghis Khan and his successors went even further, learning so much from Chinese and Persian engineers that Khubilai Khan actually overthrew China's Song Dynasty and made himself its emperor in 1279.

Mao Zedong, one of the 20th century's ablest irregular commanders, theorised much of this learning in his massively influential book *On Protracted War* (this served more or less as the Viet Cong's playbook in the 1960s and 70s). Mao saw three main ways to fight an irregular

war. When the irregulars were weak, he suggested, it made sense for them to focus on the countryside. They should infiltrate villages, kill their headmen, intimidate the other peasants and ambush government forces when they tried to move around.

If that went well, the revolutionaries should move up to the next level, which was urban insurgency. Many governments did not really care much about what happened to the peasantry, and would follow the age-old strategy of simply ignoring rural irregulars; but when violence moved into urban concentrations of population and wealth, it could really hurt the rulers. The government might counterattack in force and defeat the revolutionaries—in which case, Mao recommended, the irregulars should just retreat to the first level of rural insurgency and bide their time until they were ready to assault the cities again. If, on the other hand, the irregulars won and took control of major cities, they should move up to the third and final stage. This involved a transition to regular combat, using large formations to defeat the government's forces in the field and conquer the capital. In ideal situations, such as prevailed in Vietnam (but not in China during Mao's irregular war against Chiang Kai-shek), they could also call on conventional forces from allied powers to invade the country in this final stage.

The modern irregular wars which Mao was thinking about were unusual in historical terms because the insurgents—whether nationalists, communists, fascists or Islamists—normally had political aims, hoping to overthrow a government and replace it. In earlier times, irregulars were usually simple parasites, wanting to suck as much wealth as possible out of an agricultural empire. The 13th-century Mongols who conquered China, Persia and the Middle East were an exception: the last thing most irregulars wanted was to overthrow the regimes on which they preyed. When empires did collapse in the face of irregular challenges, it was almost always because the empires reacted to the threat in ways which led them to consume themselves.

The Roman Empire in the 4th and 5th centuries is the classic example. For centuries, the empire had mostly managed just fine with its own version of the same playbook the Chinese used, combining war, containment and bribery to reduce the irregulars pressing against their borders to mere nuisances. But population growth beyond the borders, changes in tactics, the rise of new threats from Persia and (above all) divisions within the Roman ruling class made that impossible. From the 370s onwards, incursions into the empire came too thick and fast for the central government to respond effectively. Populations along the frontiers increasingly turned to local elites to organise defence. In return for shouldering this burden, aristocrats in the borderlands started demanding that the taxes which peasants previously paid to the central government should instead come to them. Whenever they succeeded in this, a little less money went to Rome, leaving the central government even less able to defend its subjects—making local elites' demands to appropriate taxes for themselves even more plausible. These local elites of course still had to find ways to deal with the irregulars, and the only tools available were the same ones which the central government had been using. So the local Roman elites intermarried with Goths, Huns, Franks and other outsiders and bribed their followers with land until the distinction between Roman and non-Roman

ceased to mean much. More and more of the empire split up into small principalities ruled by local warlords, paying lip service to Rome but basically ignoring it. No-one got around to overthrowing the emperor in Rome until 476, but by then the empire had been a dead letter for decades. There are some obvious lessons for the 21st century in this.

What To Do About Irregulars

My conclusion is rather a depressing one. Irregular warfare will probably always be with us. It is a structural feature of international systems which combine rich societies which defend their civilian populations with powerful but expensive and slow-moving armies. Such situations create opportunities for small, fast-moving and hard-to-detect forces to use irregular violence to achieve their goals, regardless of whether those goals are political or merely felonious.

Organised states with regular armed forces can normally defeat irregulars when they really want to do it, but the cost is often enormous. It is usually cheaper for governments to cut a dishonourable deal with the irregulars, negotiating the threat down to a tolerable level of background noise and then ignoring it. More often than not, even when governments do pour resources into completely defeating irregular enemies, new irregular enemies will appear as soon as an opening presents itself. Irregular wars are never really over.

Irregular warfare has been around for 5,000 years. There truly is no new thing under the sun, and regular armies have been forced to learn and relearn the same tactics, operations and strategies for combating irregular opponents for millennia—which perhaps goes to show why it's a good idea to keep a few historians around.

Professor Ian Morris observing the Last Post ceremony at the Australian War Memorial.

New World Orders: The Rise of China in Long-Term Perspective

The Rise of the East

Half a lifetime ago, in 1989, I watched what I assumed would be the greatest geostrategic upheaval of my times, when the Berlin Wall came down. But 15 years on, I began to wonder whether I had been right about that. Certainly 1989 had been a watershed, but perhaps its biggest event had not been the collapse of the communist regime in Berlin; perhaps it had actually been the survival of the communist regime in Beijing. By the early 2000s, the astonishing growth of the Chinese economy seemed to point to an unprecedented shift in wealth and power from West to East, and in the late 2010s, China's economy is, by most ways of measuring, the biggest in the world.

This extraordinary episode has remade maps of all kinds. The most altered is probably the financial map: all around the world, leaders are beginning to look more to China than to the United States or European Union for investment. Some European countries have already joined the Chinese-led Asian Infrastructure Investment Bank; others are talking openly about signing up to China's Belt and Road Initiative. The military map, though, has changed almost as much. Never again will an American president send a fleet through the Taiwan Strait to intimidate Beijing, as Bill Clinton did in 1996. The cultural map is shifting too, with Confucius Institutes popping up on every continent. The 21st century, journalists and pundits keep proclaiming, will be the Asian century.

On the intellectual front, Westerners have found themselves confronted by new questions: How and why did this happen? Where is it leading? To some analysts, it seems obvious that the default position for China is to be as weak on the international scene as it was during what Chinese call the 'Century of Humiliation', from the 1840s

to the 1940s. Such thinkers often see what has happened since the 1980s as merely a temporary aberration from the trend line. Other analysts, however, noting that China was a great power through most of its history, conclude that it is the 'Century of Humiliation' which was a temporary aberration. China's current rise to prominence strikes them as merely the return of normal conditions.

The debate is, at heart, about long-term history: about what the pattern of the past has been, what the great trends are, where they are pointing and what, if anything, might disrupt them. It was in the spirit of these arguments that I started getting interested in comparative Western and Eastern history in the mid-2000s, suspecting that an archaeologist's perspective might have something to add.

The Pattern of the Past

I began my career in the classics, studying ancient Greece and Rome. Since the 18th century, the intellectual foundation for such research has been the idea that there was something unique about ancient Greco-Roman culture, and that the reason Europe came to dominate the world was that it had inherited this vital spark. But if that was true, how could it possibly be that the East now seemed to be threatening to overtake the West?

The answers being offered to these questions in the mid-2000s seemed to me to fall short in two main ways. One was that they were thinking on too small a scale. To answer the questions, I suspected, we needed to look at history in the *really* long term, which in this case meant going back 16,000 years to the end of the last Ice Age. Only on this scale could we really see the long-term patterns.

The second problem was that analysts could not disagree on what kinds of patterns they should be looking at. It seemed to me that the debate was really one about social development, the ability of groups of people in different parts of the world to get things done and to master their physical, political and intellectual environments. We needed to find a way to measure social development in East and West across thousands of years, then compare these trend lines, explain the differences and, armed with this knowledge, think seriously about where things might go next.

So this was what I set out to do, in a book which was published in 2010 as *Why the West Rules—For Now* and a follow-up called *The Measure of Civilisation*. Published in 2013, this presented the quantitative side of my case in more detail. There are, of course, lots of technical details for specialists to argue over, such as the definition of terms (particularly the very concepts of East and West) and the mechanics of measuring development; but, rather than rehearse all the details here, I will get straight to the point. Basically, what I did was produce a graph showing the shape of history, measuring

Eastern and Western social development from 14,000 BC to AD 2000 (which I set as the cut-off point for my analysis).

Three interesting things leapt out from the graph. First, Western social development has been higher than Eastern for 90 per cent of the time since the end of the last Ice Age. Second, throughout these millennia, development scores in East and West alike have usually been rising—but not always. There have been periods when development has stagnated or declined, and even times when it collapsed, in what historians have traditionally called 'Dark Ages'. And third, while Western development has been higher than Eastern for most of the last 16,000 years, it has not always been so. For one extremely long and extremely important period, from roughly AD 550 to 1750, China was indisputably the most developed part of the world.

I devoted the bulk of *Why the West Rules—For Now* to explaining these patterns, but here I will just draw out four points, which I hope might be of some interest to those professionals in arms who are concerned about the strategic competitions of the coming century.

Geography

The first, and longest, of these points is the explanation for the shape of history. Historians are notorious for giving long, complicated answers to even the simplest questions, but in this case the answer comes down to just one word: geography. The motor of history is not great men, religion, institutions, culture or even the last fallback of the historian, accidents; it is geography. The reason for that is that people are pretty much the same everywhere in the world, and so the societies they create tend to develop in pretty much the same ways; but what differs are the places where these societies do their developing. The Australian outback is simply a very different place from the river valleys of Egypt and Iraq, and so it has had a very different history. Geography drives social development.

However, as you have no doubt noticed, history is a very messy business. That is because geography is also messy. In particular, geography is a two-way street. While geography determines social development, social development determines what geography means, and history is the result of the interaction between the two.

The details of the dance of development and geography fill the books I have mentioned, but here I want to put flesh on the bones of these very abstract claims by looking at just one case study, the changing meanings of the Atlantic Ocean across the past 600 years. Six centuries ago, the Atlantic was, for all practical purposes, too big to cross (the Viking voyages to North America around the year 1000 had taken place under very special circumstances). It functioned chiefly as a barrier cutting Western Europe off from easy access to the rest of the world, and above all to the world's main cores of wealth,

in the Middle East, India and China. Social development was much higher in the East than anywhere else, and China was the most productive, creative and inventive part of the planet.

Being the centre of innovation, though, is not always good, and in this case, two of the inventions that came from China's high level of development (both of which I mentioned in the first of these lectures) ended up changing the meanings of geography in ways that hurt the East badly. The first was guns, invented in China sometime around the 12th century; the second was ocean-going ships, which could reliably sail for thousands of kilometres and then get back home again (also developed in China sometime around the 12th century). Both did great things for Chinese development, but both also spread like wildfire through the band of great agrarian civilisations linking China to the Mediterranean.

The new techniques for building ships meant something very different in Europe from what they had meant in China. As early as the 1490s, ships could cross the 5,000 kilometres from Spain to the Caribbean and then come home again. Yet for centuries to come—until the days of Captain Cook, in fact—the 8,000 to 10,000 kilometres separating China from the New World remained just too much water to cross. The Pacific Ocean remained a barrier, but the smaller Atlantic began being transformed from a barrier into a superhighway connecting Europe to the rest of the planet. Geography had changed its meanings. Putting together the new ships and the new guns, Europeans could now sail wherever they liked and shoot the people they met when they got there.

The Atlantic turned into the greatest accelerator for social development that the world had ever seen. European merchants created what historians call the 'triangular trades'. Starting off in Bristol or Liverpool, a man could fill a boat with manufactured goods (guns, beads, cloaks, hats and so on), then sail to West Africa and swap them for human beings, making a profit on the transaction. He could then carry the humans to Jamaica or Virginia, exchanging them for sugar or tobacco, again making a profit. Then he returned to England, selling his New World imports for yet another profit, buying an even bigger shipload of manufactured goods and setting off for another round of profit-making. There had never been such an engine of economic growth, and people all around the North Atlantic rebuilt their societies to exploit it. Capitalists built factories in Western Europe and workers flooded into them; chiefs waged wars to capture more slaves in West Africa; and planters expropriated natives in the Americas.

In Europe, a cascade of breakthroughs followed. Intellectuals everywhere had always wondered about what made the winds, tides and stars move just as they did, but now Western Europeans realised that if they devoted enough resource to answering these questions, unlimited wealth would be the result. Just as important, in the countries most committed to Atlantic trade—England and the Netherlands—elites realised that if they stopped burning intellectuals who talked about natural science, they might get rich too.

This was why Europeans had a Scientific Revolution in the 17th century while Arabs, Persians, Indians and Chinese did not: not because Europeans were cleverer or more rational, but because the new meanings of geography were thrusting new questions on them. Similarly, it was Europeans rather than Asians or Africans who had an Enlightenment in the 18th century, turning scientific methods onto the workings of their own society; and Europeans rather than anyone else who had an Industrial Revolution in the 19th century, unleashing the awesome power of fossil fuels to drive machinery. Britain, the country which led the way in this, was suddenly able to project its power globally. By 1850, Britain bestrode the world like a colossus.

Strangely, when I was studying history in a British high school in the 1970s, all our history textbooks stopped around the year 1850. Britain's tragedy, however, was that history did not stop. The same forces which had effectively shrunk the Atlantic, propelling Britain to the top of an increasingly integrated world order, kept working; the meanings of geography kept changing. Much of Britain's strength had come from drawing North America into a British-dominated world economy, but as the Atlantic and the prairies shrank further, Americans steadily pushed Britain off the top spot. By 1950, it was the United States which bestrode the world like a colossus.

I didn't study history in an American high school, but friends who did assure me that their history textbooks all stopped around the year 1950. Since then, America's tragedy has been much like Britain's. Space continued to shrink, and the Pacific Ocean became as manageable as the Atlantic had long been. Part of the United States's strength has come from drawing East Asia into an American-dominated world economy; but by 2000, China appeared to be pushing the Americans off the top spot.

This is what a long-term perspective tells us about the rise of China. It is not the doing of a single man, even one as extraordinary as Deng Xiaoping. Nor is it the result of Confucian culture, let alone the consequence of accidents. It is inexorable, driven by the deep-seated forces of geography—which means that there is no silver bullet to stop it. Politicians can squabble over exchange rates, tariffs and immigration; they can build walls and pass laws; but they are not going to stop the process. No-one can foresee the details of what will happen. China's economy could well stagnate, as Japan's did in the 1990s. It could even collapse. But if either of these things happens, other parts of East Asia and/or South Asia will fill the gap, just as China itself did when Japan's lost decades began.

Come what may, the rise of the East is the big fact of our lifetimes.

Projections

If I'm right about this and have correctly identified the motor driving the story, then perhaps we can do something interesting with this information, by projecting the trends forwards to get a sense of where they might be taking us. Obviously projections of this

kind are driven entirely by the assumptions we make, so I decided to set just a very conservative baseline, assuming that Eastern and Western social development will continue to increase across the 21st century at the same pace at which they increased across the 20th. In reality, this is very unlikely, because stable century-on-century growth has been very much the exception in modern times; but it does at least set a benchmark.

The result this linear projection produces is that the Eastern development score catches up with the Western score and overtakes it in the year 2103. That's a nice precise date—if we get to 2104 and it hasn't happened yet, you'll know I was wrong; but by 2104 I'll be long dead and won't care. But, silly as that level of precision would be, the exercise does have some value. Unless something changes dramatically, the United States will probably still be at the centre of the global order a generation from now, and quite possibly two generations from now, but probably not three generations from now.

A World at 5,000 Points

Something else rather interesting comes out of this linear projection. The social development index which I devised allocates scores to Eastern and Western development on a scale running from 0 to 1,000 points (although a score of zero is actually impossible, because at that level everyone would be dead). Getting from the end of the Ice Age to AD 2000 saw scores rise from about 4 points to about 900 points, but projecting 20th-century rates of growth forwards another 100 years will see the lines meet in 2103 at about 5,000 points. That implies that, other things being equal, the 21st century will see *four times as much change* as the whole of history since 14,000 BC. That, to put it mildly, is a mind-boggling prospect. If such a thing comes to pass, it will surely mean a total transformation of what it means to be human.

That sounds like the opening of a science-fiction story, but it is not really so far-fetched. The last 100 years have already seen more change in the human condition than the previous 100,000. Globally, the average human today grows 10 centimetres taller, is 50 per cent heavier, lives almost twice as long and earns (in real terms) six times as much as his or her predecessor a century ago. In the whole history of humanity, there has never been such a transformation, and what we have seen so far is clearly just the beginning. We humans are merging with the technology we have created. Some of us have already done so, only being alive because surgeons have inserted pacemakers into our chests. We can have laser surgery to give us better-than-perfect eyesight. We can alter the genomes of our unborn children. A man with no legs ran in the 2012 Olympics. The United States's Defense Advanced Research Projects Agency is talking seriously about functional telepathy within the next 20 years, and researchers have already managed to transmit brainwaves from rats in Brazil to other rats in North Carolina.

We are living in a magical kingdom. Where it will end, and what the world will look like at 5,000 points, no-one knows. But one thing does seem certain: if we really are heading towards a planet on which all the intelligence of humanity can be uploaded onto some giant database in the sky, merged and augmented into a single superorganism with trillions of times the thinking power of everyone alive today, the trivial geostrategic questions of the early 21st century—such as whether the East or the West has higher social development—will no longer be very important.

That, I would say, is the proper long-term perspective for thinking about the rise of China. Or, to be more precise, it is part of the proper perspective.

The Worst-Case Scenario

But will something like this actually happen? As I mentioned earlier, there have been plenty of times in the past when rising social development levelled off. These episodes also seem to cluster in significant ways, suggesting that each major way of life—hunting and gathering, farming, fossil-fuel economies—can only be developed up to a certain stage before it runs up against a hard ceiling. Sometimes, people innovate their way through that hard ceiling, as Middle Easterners did by inventing agriculture after 9500 BC and Western Europeans did by unleashing fossil fuels after AD 1750; but when societies fail to break through the ceiling, development first stagnates and then falls, sometimes into centuries-long Dark Ages.

Alarmingly, every time we see a major episode of social collapse, we see the same five factors behind it, which I took to calling 'The Five Horsemen of the Apocalypse'. The first was mass migration, on a scale societies of the day could not cope with. Second, often driven by the first, was the spread of new epidemic diseases, carrying off millions. Third, in turn driven by the first two, was state failure, as governments broke down under the strains. Fourth, a consequence of the wars and breakdowns in markets resulting from state failure, was famine. And finally, always in the mix but always working in different ways, was climate change.

No-one needs me to tell them that all five factors are very much in the news in the early 21st century. It doesn't seem overly pessimistic to ask whether, rather than soaring to 5,000 points, the world is facing a hard ceiling a little over 1,000 points—in which case, development might be about to level off, decline and then collapse, as it has done so often in the past. If so, we will rerun the tape of history, but with one crucial difference. When development collapsed in the past, no-one could react to it by using nuclear weapons.

Possibly the United States and China will find ways to manage their rivalry without all-out war; possibly (but, to my mind, less probably) Russia will find ways to manage its decline without using nuclear weapons. But with nuclear proliferation proceeding fastest in

the region of the world—an arc from central Africa, though the Middle East to western China—which is also suffering the worst effects of climate change and which also hosts some of the world's most aggressive ideologies and least stable governments, it is hard to be optimistic. As I said in the first of these lectures, the next 40 years are likely to be the most dangerous in history. Einstein once said, in response to a reporter's question, 'I do not know how the Third World War will be fought, but I can tell you what they will use in the Fourth—rocks'.

That is the alternative to a world at 5,000 points.

Army

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