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The Evolution of War

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Collective violence is an evolved part of human biology, but war also evolves as part of culture. The evolution of agriculture subjected human societies to circumscription, making it harder for groups that lost conflicts to move away. Over the long run, such groups were absorbed into larger, more complex societies, which formed governments that pacified the group internally and as a side-effect increased its prosperity. In the short run, some wars broke down these larger, safer, richer societies, and in particular cases—such as much of Eurasia between about 200 and 1400 CE—the two effects of war settled into an unstable equilibrium. But the main function of war in cultural evolution across the past 15,000 years—and particularly across the past 500 years—has been to integrate societies, increasing material wellbeing. Even though wars became more and more destructive, internal pacification lowered the overall rate of violent death from 10–20 percent in nonagricultural societies to just 1–2 percent in the twentieth-century industrialized world. By the mid-twentieth century war had become so destructive that rather than unifying the entire planet, another great conflict could destroy it. However, there are numerous signs that institutions are evolving even faster than the means of destruction, and that the twenty-first century will see the emergence of entirely new forms of conflict resolution

Introduction

In this paper, I suggest that the role of war in the evolution of governance is simultaneously simpler and more complicated than most current theories recognize.

Some scholars suggest that war is atavistic, a leftover from the last common ancestor shared by humans and chimpanzees some five to seven million years ago (e.g., Wrangham and Peterson 1996; Keeley 1996; LeBlanc and Register 2003). Others, developing a tradition going back to Margaret Mead (1940), argue that war is an invention, something humans dreamed up only as their societies became more complex (e.g., Kelly 2000; de Waal 2005: 143–45).

The evidence is certainly mixed. On the one hand, historians like to point out that the twentieth century's wars were the bloodiest in history, killing probably a hundred million people (e.g., Ferguson 2006; Snyder 2010); on the other, social scientists like to point out that war is less common today than ever before (e.g., Pinker 2011; Goldstein 2011). In fact, they add, violence of all

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kinds has declined sharply in the last 65 years. By virtually any measure—deaths in battle, homicides, rapes, assaults, spousal and child abuse, cruelty to animals—our world is less violent than that of our grandparents.

Already in the 1930s, Norbert Elias suggested that Europe had been growing less violent for half a millennium (Elias 1982 [1939]). The onset of World War II seemed to many people to have discredited his thesis, but more recent quantitative research has supported it strongly (e.g., Richardson 1960; Levy 1983; Eisner 2003; Spierenburg 2008; Roth 2009). Rates of homicide have collapsed, and, despite spikes in killing during the Thirty Years War and Ming-Qing Cataclysm, the Napoleonic wars, and the World Wars, population has grown so quickly that the risk of dying violently seems to have fallen by an order of magnitude.

In the last few years, several theorists have attempted to make sense of these conflicting data within co-evolutionary models, seeing conflict and cooperation as two sides of a single process (e.g., Gat 2006; Bowles 2009; Bowles and Gintis 2011; Turchin 2011). My aim here is to support this approach by bringing in a broader historical perspective, drawing on ideas that I am developing more fully in a book (Morris, forthcoming).

The historical profession is as full of debate as any other group in the academy, but the one point that practitioners of most stripes seem to agree on is that the historian's fundamental method is storytelling (or, in more technical terms, narrative emplotment: see, e.g., Stone 1979; Appleby et al. 1994; Berkhofer 1995). Social scientists often mock this technique as naïve (Diamond and Robinson 2010 have a useful discussion), but it does force us to think about the coevolution of war and governance as a continuous, ongoing process, rather than as a matter of successive stages in a more abstract model.

Historical narrative certainly has its drawbacks, particularly in the way it tends to encourage historians to focus on small spatial and temporal units defined by shared cultural traditions. This choice is often forced on scholars by the need to master the languages in question so they can work in the archives, but it does make it much more difficult to think comparatively. As a result, historians all too often leave the search for the underlying logic of violence to scholars in other fields and—in a process that can become rather circular—regularly seem to assume that causation will be located in the same cultural traditions that they use to define the units of analysis (e.g., Keegan 1993).

However, historical narrative can also bring valuable insights, particularly in foregrounding the details of the back-and-forth between humans and their environment. I will suggest that geography has played a decisive part in shaping the relationship between war and social development, but that social development has simultaneously played a vital part in shaping what geography means (I develop this argument more fully in Morris 2010). The result has been what we might call a 'paradox of violence.' In certain geographical settings, violence drove the creation of increasingly effective governments,

which pushed down rates of violent death; but more effective governance changed what geography meant, with the result that entirely new geographical settings became more advantageous. The centers of power, prosperity, and peace shifted around the world in response to this process, producing ever more effective forms of governance, and driving social development higher and higher. The great question that remains, though, is whether the long-run shape of the growth curve will be logistic—flattening out when the entire planet is subsumed under a single government—or boom-and-bust, leading to a catastrophic collapse.

I begin with a few words on the evolutionary logic that seems to underlie human violence, then turn to how geography has shaped the outcomes. The bulk of the paper looks at the ways these processes have played out across the last fifteen thousand years. In the next two sections, I include a number of references to specific works that have influenced my thinking, but after that I will be much more sparing with citations, because of the huge number of historical accounts that have been published. I provide fuller references in my book *War! What is it Good For?* (Morris, forthcoming).

The Logic of Violence

In everyday life, says the strategist Edward Luttwak, “a noncontradictory linear logic rules, whose essence is mere common sense. Within the sphere of strategy, however ... another and quite different logic is at work and routinely violates ordinary linear logic.” War “tends to reward paradoxical conduct while defeating straightforwardly logical action, yielding results that are ironical” (Luttwak 2001: 2).

The central paradox in the evolution of war, I believe, is that war itself has caused the decline in violence that social scientists since Elias have documented.

Evolutionary biologists have produced a large literature on violence as a solution to coordination problems (generally going back to Maynard Smith 1982). Disputes over almost anything can lead to violence, although in most species confrontations between young adult males over access to food, mates, and prestige tend to head the list. Among social animals such as some species of ants and apes, certain kinds of disputes may be solved by group violence that we can loosely call war—that is, intraspecies violence between entire communities (Gotwald 1995; Wrangham and Peterson 1996).

Humans behave in rather similar ways. From Helen of Troy to the War of Jenkins’ Ear, people have used group violence to try to solve coordination problems of almost every imaginable kind. The one great difference between humans’ and other animals’ use of violence, though, is that we humans have evolved enormous, fast-processing brains over the last two million years,

which have allowed us to augment biological with cultural evolution (Klein 2009).

Unlike other animals, humans can change the ways they do things and transmit their ideas through time. The result has been that our cultures have evolved, and with them our ways of making war, whereas among other animals—even our genetic nearest neighbors, the great apes—the only way to change how the species does things is through the painfully slow process of biological evolution. And, as in all such processes, cultural evolution has then fed back onto the environment, transforming it in ways that drive further cultural evolution.

On the whole, historians have not engaged very strongly with the ways social scientists have thought about the evolution of war, instead describing war ironically (in the technical sense of ‘irony’ defined by Hayden White 1973) as what Barbara Tuchman (1984) famously called a “march of folly.” Some social scientists, however, have tried to unpack the deeper logic behind human recourse to violence.

Steven Pinker (2011: 679) suggests thinking in terms of a “Pacifist’s Dilemma” game (Figure 1): despite the fact that the costs to the victim of aggression can be vastly disproportionate to the benefits to the aggressor, he argues, there are times when the payoffs make it irrational to be peaceful. The best way to explain the historical decline in violence, he argues, is by asking what has changed the payoffs so that peace has become the rational choice in reiterated Pacifist’s Dilemma games.

		Other's choices	
		Pacifist	Aggressor
Own choices	Pacifist	Peace (5) Peace (5)	Defeat (-100) Victory (10)
	Aggressor	Victory (10) Defeat (-100)	War (-50) War (-50)

Figure 1. The Pacifist’s Dilemma (from Pinker 2011: 679).

Over the long run—for my purposes, the roughly fifteen thousand years since the end of the last ice age¹—the payoffs clearly have changed. The reason is that violence, as Luttwak observes, has a built-in, contradictory, nonlinear logic. In the very long run violence is self-defeating, because war and the fear of war drive the creation of larger societies that pacify themselves internally, in large part so that they can fight more effectively against other societies. This is more or less the insight Hobbes offered in *Leviathan*, long before there was much evidence to work from, and the point Mancur Olson (2000) made with his theory of rulers as stationary bandits.

Over the last fifteen thousand years, wars between societies have become bloodier and bloodier as societies become larger and more sophisticated. But as societies have become larger and have pacified themselves internally, population and wealth have exploded, and the proportion of humanity dying violently has plummeted. In Stone Age societies, it is not unusual for 10–20 percent of the population to die violently (e.g., Keeley 1996; Bowles and Gintis 2011: 143-45), but in the twentieth century CE, when modern states fought two world wars, committed multiple genocides, and used nuclear weapons, just 1–2 percent of the world’s population died violently. War has been good for something after all (Morris, forthcoming).

Latitudes not Attitudes

The historical record suggests three broad conclusions about how war has made humanity safer and richer.

First, while violence is a very inefficient way to create bigger, safer, and richer societies, war (or the fear of war) seems to be pretty much the only mechanism that has worked. Hobbes distinguished between “commonwealth by *institution*,” a peaceful process in which “men agree amongst themselves, to submit to some man, or assembly of men, voluntarily,” and “commonwealth by *acquisition*,” a violent process in which “a man maketh his children, to submit themselves, and their children to his government, as being able to destroy them if they refuse; or by war subdueth his enemies to his will, giving them their lives on that condition” (Hobbes 1962 [1651]: 133). The empirical details, however, show that in reality the two always go together. Soft power is the glue that makes large societies hang together, but it always depends on hard power.

Second, the evidence also shows that war is an evolutionary mechanism that works its magic only on very long time scales. Some people (particularly on the winning side) do find war a positive experience, but most people do not.

¹ Counting here from the end of the Late Glacial Interstadial, around 12,700 BCE. Some archaeologists prefer to count from the end of the Younger Dryas cold period, around 9600 BCE, but some of the key changes were clearly underway before the Younger Dryas set in around 10,800 BCE.

Third, war's ability to produce bigger, safer, richer societies is shaped massively by geography. This builds on the argument in my most recent book, that geography has been one of the prime movers in history, but in a rather complicated way: geography determines how societies develop, but how societies develop determines what geography means, in a back-and-forth relationship (Morris 2010: 26–35).

Anthropology and archaeology suggest that while some societies are less violent than others, every human group sometimes resorts to violence to settle its disputes (e.g., Kelly 2000). However, the shift toward bigger, safer, richer societies began in a very specific part of the planet, between roughly 20 and 35° North in the Old World and 15° South and 20° North in the New (Figure 2). I like to call this zone the lucky latitudes (Morris 2010: 81–85).

When the world warmed up at the end of the last ice age, this part of the world had far and away the densest concentrations of potentially domesticable plants and animals (Diamond 1997: 85–191; Mithen 2003). In Southwest Asia, the region of the lucky latitudes with the densest concentrations of all, cultivation of plants (i.e., selection for larger grains: terminology after Fuller 2007) seems to have begun around 11,000 BCE, and by 9500 BCE, just a century after the end of the twelve-hundred-year-long Younger Dryas mini-ice age, cultivated plants appear in the paleobotanical assemblages from numerous sites. In South and East Asia, where concentrations of potentially domesticable plants and animals were somewhat less dense, cultivation was under way by 7500 BCE; in Mesoamerica and the Andes, where concentrations were somewhat less dense still, it had begun by 6500 BCE.

We might divide the regions outside the lucky latitudes into three types. In the first (e.g., parts of North America and Sub-Saharan Africa), potentially cultivable plants had evolved, but were either rare or required more complicated genetic mutations to become useful to humans. In such cases, cultivation and domestication did evolve indigenously, but began later than inside the lucky latitudes. The second group of regions (e.g., southeast Australia) was geographically well suited to cultivation and domestication, but no potential cultivars had evolved; in these cases, humans carried on foraging until outsiders imported agriculture thousands of years later. The third group of regions (e.g., Siberia, the poles, the great deserts) were simply unsuitable to agriculture, which could not be carried out there prior to the era of modern science.

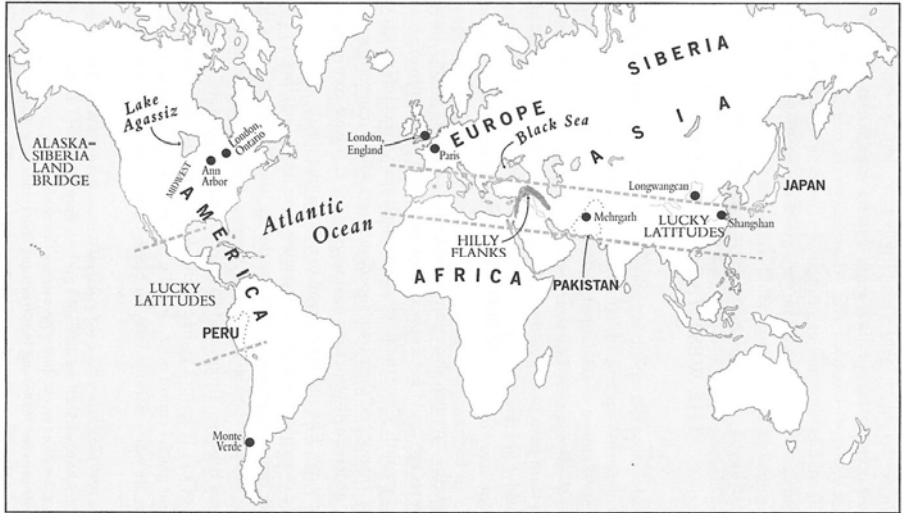


Figure 2. The lucky latitudes (from Morris 2010: 82).

True domestication, the evolution of genetically modified plants and animals that can reproduce only with continued human intervention, typically got underway about two thousand years after cultivation. It began around 7500 BCE in Southwest Asia, 5500 BCE in South and East Asia, 3300 BCE in Mesoamerica, and 2800 BCE in the Andes (Figure 3).² The consistent fit between resource density and date of domestication suggests strongly that geography, rather than race, culture, or great men and women, was the determining factor (Diamond 1997).

Domestication massively increased the supply of food per unit of land, and the world's population exploded from about half a million people twenty thousand years ago to five million ten thousand years ago. By that point, the great majority of humans—perhaps 80–90 percent—lived within the lucky latitudes.

As crowding increased, people probably found more things to fight about, and they certainly found that the costs of defeat were rising. In most landscapes, it is relatively easy for foragers who lose a fight to move away and start over somewhere new, but as population densities rose, that became more

² All the dates continue to be debated among archaeologists, although the margins of error are steadily shrinking, and there is no longer much argument over the basic Southwest Asia/South and East Asia/Americas sequence. I generally follow the interpretation in Mithen 2003, with some updates.

difficult. The fixed assets worth defending also increased, as capital investments in agriculture (cleared fields, irrigation systems, terraces, farmhouses, etc.) became more valuable.

In a classic paper, Robert Carneiro (1970; cf. Carneiro 1988) labeled this process circumscription, and in an almost equally classic book, Michael Mann (1986: 46–49) rebranded it as caging. Whichever name we use, though, the consequences were the same. Groups in the lucky latitudes started fighting one another more intensely, and instead of running away, the losers often found themselves absorbed into larger societies. Hierarchy increased as societies reorganized themselves to compete more effectively in this new environment, raising more powerful armed forces, pacifying themselves internally, and increasing revenue flows to central government.

This was an extremely nasty process, brought about through rape, slaughter, impaling, and enslavement. It began in Southwest Asia, where the first centralized governments and cities emerged around 3500 BCE in Sumer and Susiana (in modern southern Iraq and southwest Iran). By 2750 BCE comparable institutions had been created in South Asia (Harappan/Indus Valley culture), and by 1900 BCE in East Asia too. The New World evidence is more controversial, but by the first centuries BCE and CE we can certainly speak of states in Mesoamerica (Teotihuacán and Monte Albán) and the Andes (the Moche culture). The sequence of their appearance closely follows the sequence for the beginnings of agriculture, with the rise of states generally coming three to four millennia after domestication began (Figure 3).

Not the Western Way of War (10,000–1 BCE)

In the last twenty-odd years, more and more historians have started speaking of a distinct “Western Way of War,” said to have been invented in ancient Greece and passed down to modern Europe and America. The military historian Victor Davis Hanson, who coined the term, suggests that “For the past 2,500 years, there has been a peculiar practice of Western warfare, a common foundation and continual way of fighting, that has made Europeans the most deadly soldiers in the history of fighting” (Hanson 2001: 5).

Greek city-states regularly settled their differences with head-on charges between phalanxes of armored spearmen. “It is this Western desire for a single, magnificent collision of infantry,” Hanson argues (1989: 9), “for brutal killing with edged weapons on a battlefield between free men, that has baffled and terrified our adversaries from the non-Western world for more than 2,500 years.”

In his *History of Warfare*, the most influential general book on the subject, John Keegan goes further. Since 500 BCE, he suggests, there has been “a line of division between [the Western] battle tradition and the indirect, evasive,

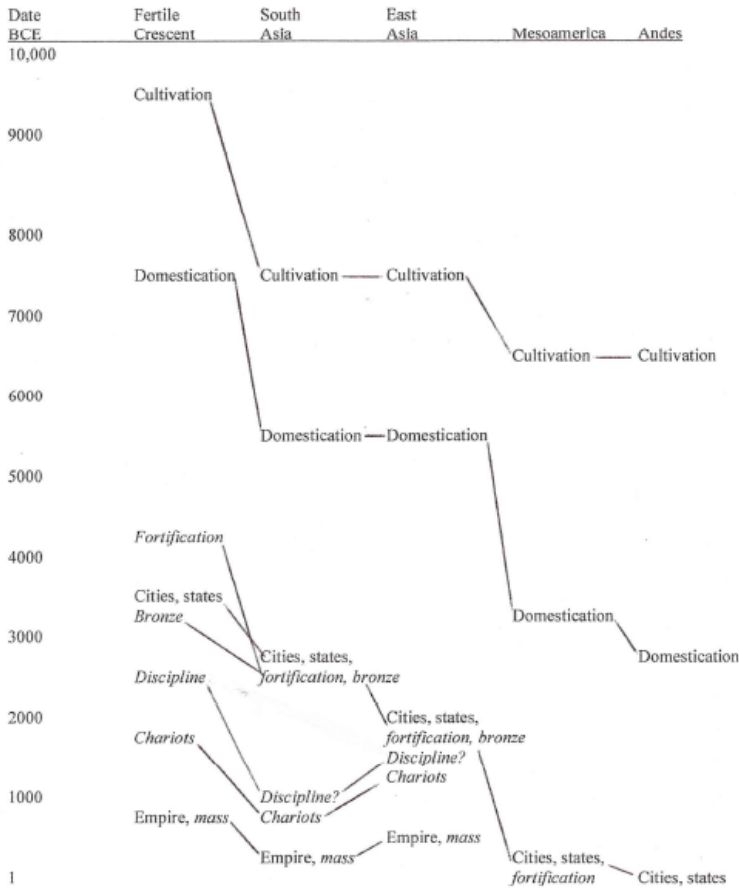


Figure 3. The ancient revolutions in military affairs, 10,000-1 BCE. Social and economic changes are in roman script, military changes in italics (based on Morris, forthcoming: Table 2.1).

and stand-off style of combat characteristic of the steppe and the Near and Middle East: east of the steppe and south-east of the Black Sea, warriors continued to keep their distance from their enemies; west of the steppe and south-west of the Black Sea, warriors learned to abandon caution and to close to arm's length" (Keegan 1993: 332-33).

The data, however, do not bear this out. Rather than a Western Way of War, there has been what I would call a Productive Way of War, created by

circumscription/caging all across the lucky latitudes, and spread from there across the rest of the world.

I call these wars ‘productive’ not just to provoke a reaction, but because I believe that it really is the best word. Circumscribed wars produced larger societies, which pacified themselves internally, increasing wealth and population and simultaneously reducing the overall rate of violent death. These wars tended to be even crueler and deadlier than the forms of warfare practiced in prehistory, but despite their short-term costs, in the long term the violence made people safer and richer. ‘Productive war’ seems like a very good description of this process.

Through most of human history, people have fought more through raids and ambushes than through pitched battles (Keeley 1996; LeBlanc and Register 2003; Gat 2006). In the ancient lucky latitudes, however, as war drove the evolution of larger, safer, richer, and more sophisticated states, these larger, safer, richer, and more sophisticated states in turn drove a series of revolutions in military affairs. Like the late-twentieth-century revolution in military affairs (discussed in Krepinevich 1994 and Blaker 1997, and with more skepticism in Biddle 1998) they consisted of interlocking technological, organizational, tactical, and logistical advances; and again like the late-twentieth-century revolution in military affairs, we should think of these as being social, economic, cultural, and political transformations as much as military ones.

All across the lucky latitudes, the first of these was fortification, which meant organizing communities well enough to build walls that would keep out raiders. Southwest Asia clearly had the earliest fortifications, perhaps as early as 9300 BCE at Jericho (the evidence is disputed), and certainly by 4300 BCE at Mersin, with a handful of possible cases in between these dates; and by 3500 BCE, fortifications were becoming quite common.

At first glance, fortification looks like example of what some evolutionary biologists like to call the Red Queen Effect (Ridley 1995), in which adaptations in one species (e.g., foxes evolving to run faster) merely produce selective pressures for adaptations in other species (e.g., rabbits that also run faster). These cancel out the advantages of the initial change, and no species ever pulls ahead. Better-organized societies that could build fortifications went hand-in-hand with better organization of raiding, and, as destruction layers in settlements attest, raids turned into sieges.

Unlike the classic Red Queen effect, though, ancient revolutions in military affairs did have major long-term consequences. In every case, a revolution could only succeed if a society reorganized itself with more powerful governmental institutions; and as societies did so, their governments pacified them internally in the name of cohesion against external foes (see Bowles 2009, or the highly mythologized account of early Rome in the first-century BCE historian Livy).

Second (where the chronology is fine-tuned enough to make the distinction) came the substitution of bronze for stone weapons, in the Old World at least. There, bronze weapons came into use in the late fourth millennium BCE, around six thousand years after cultivation had begun, and almost completely replaced stone weapons by 2000 BCE. Bronze reached the Indus Valley by 2500 BCE and the Yellow River Valley by 2000 BCE, perhaps in both cases by diffusion from Mesopotamia, and rapidly replaced stone for weapons in both places.

The New World's lucky latitudes, however, moved more slowly. If their populations had followed the Old World timetable and begun casting bronze weapons six thousand years after cultivation, these artifacts would appear in Teotihuacán and Moche sites, but they do not; and if bronze had become common another thousand to fifteen hundred years later, as it did in Southwest Asia, Cortés and Pizarro would have met Aztecs and Incas with bronze (although not iron) spearheads—which, of course, they did not. Andean metalworkers did experiment with copper around 1000 BCE, but metal never replaced stone for tools or weapons.

Just why the New World's early states were not major bronze producers remains an open question. Jared Diamond (1997: 360-70) suggests that geography may explain why innovations (including writing) came later and spread more slowly in the New World than in the Old. Eurasia, he points out, runs basically East-West, and ideas originating in Southwest Asia could spread thousands of miles to Europe or China within the same band of latitudes. The Americas, by contrast, run basically North-South. Ideas bubbling to the surface in Mesoamerica or the Andes could only circulate among a small group of people (relative to the Old World) before having to be carried across latitudes with very different ecologies. Because the interlinked populations in the New World were so much smaller than those in the Old, Diamond suggests, ideas and practices took longer to appear and much longer to spread.

The third of the Old World's revolutions in military affairs, and arguably the most important, was in command and control. It takes proper military discipline and staff work to maneuver large bodies of men, feed them, and get them to go right up to enemies and stab them (particularly when the enemies are stabbing back). Command and control are hard to document archaeologically, although the famous Vulture Stele from Lagash in Sumer, carved around 2450 BCE (Figure 4), seems to show a somewhat disciplined formation of infantry with officers. (Even if there is a good deal of artistic license in this representation, it certainly demonstrates that third-millennium Mesopotamians understood the concept and presumably also the advantages of battlefield formations and discipline.) Most likely, command and control began evolving soon after the rise of states, and persuading young men to do what they were told in life-threatening situations may have been Leviathan's major challenge.



Figure 4. The Vulture Stele, from Lagash in Sumer, c. 2450 BCE.

Fourth—in Eurasia—was the introduction of chariots. Horses were domesticated in Ukraine on the steppes (Figure 5) around 4000 BCE, but not until about 2200 BCE had herders bred beasts big enough to pull carts. By 1900 BCE such carts had crossed the Caucasus Mountains into Southwest Asia, and before 1700 BCE light versions carrying archers armed with composite/reflex bows were being used on battlefields. Their mobility revolutionized fighting, and by 1500 BCE they were the decisive arm in Near Eastern battles. At the Battle of Kadesh in 1274 BCE the Egyptians and Hittites each fielded about 3500 chariots. By this point chariots were beginning to be used in Chinese war, and over the next few centuries they made their way into India too. (In the New World, where there were no horses, there were of course no chariots either.)



Figure 5. The steppes (marked in gray).

The fifth ancient revolution in military affairs was the appearance of mass formations of iron-armed and armored shock troops. This began in Assyria around 900 BCE, with dense columns of heavy infantry used in combination with cavalry, the latter made possible by the breeding of even bigger horses that could carry an armored man for hours at a stretch. Between 700 and 400 BCE Greek armies that relied overwhelmingly on heavy infantry without much cavalry support became the most effective land force in Western Eurasia, but by 300 the Macedonians had reintroduced cavalry and designed a more flexible phalanx. By 200 BCE, however, the Romans were able to get the better of the Macedonian kingdoms with armies that downgraded cavalry once again but exploited much more flexible formations of legionary infantry.

In East Asia, Chinese armies followed a similar path a few centuries later, with mass heavy infantry coming in by 500 BCE and cavalry by 400, although iron did not fully replace bronze until the second century BCE. By 300 BCE South Asia had produced yet another variant, with armored elephants playing the decisive shock role and infantry relying more on the bow than the spear. Everywhere across Eurasia's lucky latitudes, however, the first millennium BCE saw armies that regularly numbered in the hundreds of thousands seeking to win wars through battles decided by head-on collisions.

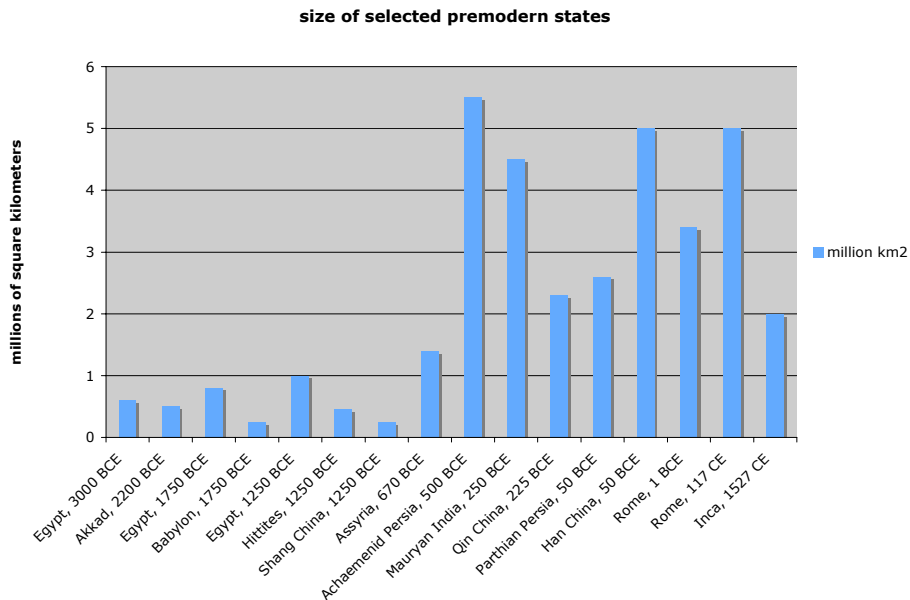


Figure 6. Size of selected Eurasian states, 3000 BCE–117 CE, compared with the Inca Empire on the eve of the Spanish conquest (based on data in Taagepera 1978, 1979).

The ancient revolutions in military affairs drove spectacular state expansion in Eurasia. Geographically, empire size leaped an order of magnitude between the second millennium BCE and the first. New World empires, which had little bronze and no iron or horses, still had not caught up on the eve of the Spanish conquest (Figure 6).

No reliable statistics on rates of violent death survive, so we are reduced to using qualitative literary and artistic sources and unsystematic evidence from excavations. That said, the picture these sources provides does seem remarkably consistent, and the great Roman, Han, and Mauryan empires appear to have been much safer places than the world of prehistoric bands. As mentioned earlier, anthropologists often estimate that 10–20 percent of Stone Age people could expect to die violently, as opposed to 1–2 percent in the twentieth century CE. The empires of the late first millennium BCE must have lain somewhere between 2 percent, the upper end of the modern range, and 10 percent, the lower end of the prehistoric range. My guess (Morris, forthcoming: Chapters 1–2), for what it is worth, is that they were closer to the

modern than the prehistoric end of this range, most likely in the area of 2–5 percent.

This ancient decline in violence was the result of a Productive Way of War, developed all across Eurasia's lucky latitudes, not a Western Way of War, invented in Greece. The ancient decline in violence also provides a valuable comparison case to the modern decline that has drawn so much social-scientific attention. Pinker (2011: xxiv) suggests that the modern decline "is a tale of six trends, five inner demons, four better angels, and five historical forces," but the similarities between the ancient and modern cases make me think we can reduce his twenty variables to just one prime mover. In the fourth through first millennia BCE and again in the second millennium CE, the real motor for the reduction of violence was violence itself. War made Leviathans, which pacified themselves, and all the other trends, inner demons, better angels, and historical forces followed in war's wake.

Eurasia's Age of Counterproductive War, 1–1415 CE

Like biological evolution, cultural evolution is a messy process. It has its own kinds of fitness landscapes, full of bottlenecks, historical accidents, and dead ends. One result of this is that productive war can regularly turn counterproductive—that is, instead of building bigger, safer, and richer societies, the long-run effect of war is in fact to break such societies down. The result: life becomes nastier, poorer, and shorter.

Cycles of state growth and collapse can be traced back very far indeed, and seem to be built into early warfare (Gavrilets et al. 2010). In ancient times, we see great social collapses in Southwest Asia around 3100 BCE (the end of the Uruk Expansion), 2200 BCE (the fall of Egypt's Old Kingdom and the Akkadian Empire), and 1200 BCE (the end of the Bronze Age), and in South Asia around 1900 BCE (the fall of the Indus civilization). The precise causes remain highly controversial (see Turchin 2003, 2006, 2009), but in each case the feedback relationship between cultural evolution and the environment seems to have been important. Geography drove social development, but social development simultaneously drove what geography meant, so that geographical factors that were highly advantageous at one level of development could be positively disadvantageous at another. In the two cases for which we have most information, in Southwest Asia around 2200 and 1200 BCE, collapse seems to have begun at the frontiers, with productive war changing relationships in ways that abruptly generated counterproductive wars.

Throughout the last three thousand years BCE, though, the long-run pattern was for war to be productive, driving the formation of larger, safer, and richer states. Overall, the trend line was of exponential growth, with collapses and revivals generating noise around this pattern. The noisy collapses typically produced spikes in violence, but war eventually turned productive again,

producing new states and empires that surpassed the earlier versions in size, safety, and wealth. Most of the ancient 'dark ages' lasted for two to five centuries, although states in South Asia did not regain their pre-1900 BCE level of development for a millennium, by which point the main center of development had shifted from the Indus to the Ganges basin.

But in the first millennium CE, the lucky latitudes' productive war seemed to hit its limits. At the start of the millennium, the Roman and Han Empires each ruled some fifty-plus million people spread across four to five million square kilometers. However, the success of the empires of the Eurasian lucky latitudes had changed the meanings of geography in radical ways, with disastrous results.

For thousands of years, the arid steppes stretching from Manchuria to Hungary had been a barrier preventing the northward expansion of complex society. But as the lucky latitudes became richer and richer and as bigger horses evolved on the steppes, this changed. By the last few centuries BCE the steppes had taken on two new features. First, they had turned into a highway, along which caravans could trade and ideas and germs could move; and second, they had turned into a base from which horse nomads could raid the great empires (Barfield 1989; di Cosmo 2002).

The human mobility generated by the new meanings of the geography of the steppes probably had a lot to do with the plagues that ravaged the Roman and Han Empires from the 160s CE onward, and definitely had a lot to do with the migrations that overwhelmed the empires of the lucky latitudes over the next six hundred years. Buffeted by population decline, economic crises, and mounting pressure on its frontiers, the Han Empire broke up in 220 CE. Rome came close to the same fate over the next fifty years, and then did collapse between the fifth and seventh century. In the same period, Hun migrations devastated much of eastern Iran and western India.

The Eurasian lucky latitudes remained the most developed³ part of the world in the period between 200 and 1400 CE, but on the whole their military capacity fell sharply from where it had stood between about 500 BCE and 200 CE. Armies (especially in Western Eurasia) shrank, sometimes by an order of magnitude, and command and control often collapsed. The Arab armies that overran the Sassanid Persian and much of the Byzantine empires in the seventh century rarely numbered more than ten thousand men. Wars between states shrank compared to those of ancient times, killing fewer people; but thanks to the paradox of war, as state power collapsed, overall rates of violent death moved back up.

All across Eurasia, there was a general shift in warfare from mass and discipline toward mobility. In Arabia camels often supplied this and in

³ In the sense I discuss in Morris 2010: 155-60, 623-45; 2012.

Western Europe ships, but on the whole, cavalry came to dominate war. Light horse archers were important in most regions, particularly in the open country bordering on the steppes themselves, but already in the second century CE, armored cavalry were playing a role. By the sixth century, heavy shock cavalry were the dominant arm in Byzantium, Persia, and China (in India elephants remained decisive on most battlefields, but the role of cavalry steadily increased). Heavy cavalry spread across Europe from the eighth century on, and played a much bigger role than is often realized in Turkic and Mongol forces. Generally speaking, the weaker states of the period 200–1400 outsourced conscription to noblemen/warlords, who raised troops from their retainers and clients in return for land and shares of plunder.

The overwhelming importance of mobility in this period meant that the driving force in the history of the Eurasian lucky latitudes was the relationship between this agrarian zone and the neighboring steppes and deserts. No empire from the lucky latitudes ever managed to master the nomad populations for long, and several agrarian regions were ruled by conquest dynasties from the periphery. The most effective were groups—probably the Tang dynasty in China and the Kushans in India—in fact came from the borderlands of the steppe and the settled lands, and managed to combine the battlefield power of nomadic cavalry with the high-end institutions of the settled states.

The result in the Eurasian lucky latitudes was a cycle of productive and counterproductive wars. Counterproductive wars broke down the largest societies, which provided opportunities for conquerors to wage new productive wars, building great kingdoms up again; only for these new kingdoms to generate further counterproductive wars, and so on.

In Western Eurasia, counterproductive war generally had the upper hand. In the seventh century, invading Arabs shattered the Byzantine and destroyed the Sassanid Persian Empires, creating an even larger caliphate, but this rapidly broke down into smaller, weaker states. In the late eighth century, Charlemagne conquered a very large Frankish Empire, but this broke down in the ninth century. In the eleventh century, the Seljuk Turks created another large Islamic Empire, only for that to break down too.

In India, the Guptas created a large empire in the fourth century, but it collapsed in the sixth. Between 600 and 1700 another ten kingdoms each united large sections of what we now call India (especially Vijayanagara in the sixteenth century), only to break down again.

The Sui dynasty reunited China in the late sixth century and in the seventh century the Tang dynasty achieved remarkable heights, only to collapse in the face of Turkic pressure and internal problems in the eighth. In the tenth century the Song again united China, only to break down across the twelfth and thirteenth centuries. Mongols took the throne as the Yuan dynasty in the

late thirteenth century, only to be overthrown by internal rebellion in the fourteenth. And so on.

Between 200 and 1400 CE, two forces trapped the Eurasian lucky latitudes in this cycle of productive wars (generating larger, safer, and wealthier societies), and counterproductive wars that had exactly the opposite effect, breaking larger societies into smaller ones and dragging down personal security and prosperity. First, the agrarian empires never really mastered the threat posed by small but highly mobile forces from the steppes. Even the most successful, such as the Tang dynasty, found it impossible to dominate the shifting alliances on the steppes for more than a few generations.

Second, the empires never solved the problem of scale. All of them needed to support large cavalry forces on distant frontiers, paid for by taxes raised in richer core provinces. Rulers had to walk a tightrope, maintaining armies strong enough to keep the empire peaceful, to extract taxes, and to protect the frontiers but not so strong that they could overthrow the rulers. Despite some extraordinary ingenuity (e.g., Luttwak 2009, on the Byzantine Empire), rulers basically cycled through the same handful of strategies for managing these difficulties (e.g., Elvin 1973; Luttwak 1976), none of which worked in the long run.

I suspect that these problems were simply insoluble in ancient and medieval times, and that the Roman Empire had in fact reached about as high a level of development as was possible for an agrarian society. By the eleventh century, Song dynasty China was in many ways comparable, but no society before the eighteenth century managed to break through the hard ceiling that limited the growth of agrarian states (Morris 2010).

The result: a twelve-hundred-year cycle of rising and falling empires along the lucky latitudes, productive and counterproductive wars, and spikes and troughs in violence. Once again, there are no proper statistics, but the qualitative evidence suggests (to me, anyway) that rates of violent death were overall higher than in the ancient empires (guesstimated above at 2–5 percent) but lower than in prestate societies (10–20 percent)—perhaps in the area of 5–10 percent, averaged across the whole Eurasian lucky latitudes between 200 and 1400 CE (Morris, forthcoming: Chapter 3).

Outside the Eurasian lucky latitudes, the story was very different, and in fact had more in common with Eurasia's history between 3100 and 1200 BCE than with what was happening there between 200 and 1400 CE. As agriculture spread outward from the lucky latitudes into areas such as Southeast Asia and eastern Europe or was invented independently in less resource-rich areas such as West Africa and North America, the conditions of caging and productive war spread with it. Indigenous complex societies developed from Srivijaya to Kongo and Cahokia.

The world beyond Eurasia's lucky latitudes certainly saw cycles of rising and falling states and counterproductive wars, but overall, the trend line in

much of the world between 200 and 1400 CE was very much one of productive war. The steppe nomads themselves are a clear example of this: as agricultural city-states pushed further into the grasslands, nomadic social development rose steadily. The Mongol armies that fought on the banks of the Indus River in 1221 and the Kalka in 1223, numbering perhaps forty thousand cavalry (with each rider bringing three or four mounts), vastly outclassed those that the Scythians and Xiongnu had raised fifteen hundred years earlier. Mongol armies had sophisticated siege trains, and, in their wake, brought a 'Mongol Peace.'

The New World's lucky latitudes, where agriculture began three to four millennia later than in the Old World's, also saw cycles of rising and falling empires around an upward trend line, with productive war predominating over unproductive. However, the productive war moved more slowly in the New World between the first and the fifteenth centuries CE than it had been doing three millennia earlier in the Old World (i.e., between roughly 3000 and 1500 BCE). The Aztec and Inca Empires were much bigger and probably safer and richer than Teotihuacán or the Moche culture, but, as noted above, the New World was still in the Stone Age when the conquistadors arrived. Fortifications were simple, armies small, logistics crude, command and control poor, and missile weapons ineffective (for Mesoamerica, see Hassig 1988, 1992. So far as I know, there is no equivalent survey for the Andes; see discussions in Arkush 2006, 2011; Stanish and Levine 2011).

Between the first and fifteenth centuries CE, productive war spread slowly across most of the world. There two major exceptions: first, the world's resource-poorest environments, such as Australia, the Sahara, and Siberia, where caging could barely operate and war remained unproductive, with violence generating no trend toward the creation of larger, safer, wealthier societies; and second, the world's resource-richest environments, in Eurasia's lucky latitudes, where productive and counterproductive wars had settled into an unstable equilibrium.

If there had been fifteenth-century social scientists, I suspect that they would have interpreted this pattern as meaning that productive war had limits, and that Eurasia's lucky latitudes had reached them. Already by the first century CE, they might have concluded, the Romans had done as much as could be done. No society would ever surpass that level of development.

Within the Eurasian lucky latitudes, this theory would have said, empires would rise, press against the hard ceiling, and fall, in an endless cycle of productive and counterproductive wars involving steppe horsemen. That, perhaps, is why medieval Eurasians so often saw history as a cyclical process.

Outside Eurasia's lucky latitudes, the fifteenth-century theorists might also have concluded, the rest of the world would steadily converge on what had already been achieved within Eurasia's lucky latitudes, figuring out metal weapons, mass armies, and military discipline, until—by, perhaps, 2012—

agrarian empires would rule most of the world. The most successful of them would drive rates of violent death down into the 2–5 percent range, then they would collapse and violence would spike up. War, it seemed, was evolving toward an unstable equilibrium, in which 5–10 percent of humans would die violently.

The Revival of Productive War, 1415–2012 CE

This turned out not to be the case, thanks to two inventions—guns and oceangoing ships. Guns closed the steppes and ships opened the oceans; as Turchin (2011) puts it, gunboat frontiers replaced steppe frontiers.

Guns and oceangoing ships both evolved primarily in China⁴ and then spread like wildfire across Eurasia. It took a couple of centuries for magnetic compasses, powerful rudders, and other Chinese innovations to spread across the Indian Ocean to Europe, but perhaps less than forty years for guns to make the same journey across the steppes.⁵ No invention in history had ever spread so far, so quickly.

In the fifteenth century, Europeans began making enormous improvements to both guns and ships, massively accelerating the pace of the evolution of war and kick-starting a whole new phase of productive war. Geoffrey Parker (1996) famously called the years 1500–1800 Europe’s military revolution, but we might do better to see the whole period from 1492 through 1991 as a Five Hundred Years’ War in which Europe (almost) conquered the world (Morris, forthcoming: Chapters 4–5).

Guns and ships pushed productive war down a new path. Once again, geography was decisive in how this unfolded. Packed tightly at the tip of Eurasia and unable to run away when they lost wars, Western Europe’s raging nations rapidly improved their guns’ killing power and their governments’ abilities to raise armies and equip them with cannons and muskets. But because Western Europe’s states did this simultaneously, in constant competition, none could swallow up the others. Instead, they combined bloody, apparently unproductive deadlock inside Europe with ship-borne, highly productive expansion outside it.⁶

⁴ With the obvious exception of Viking longboats, which, thanks to the favorable climatic conditions of the Medieval Warm Period and the convenient spacing of the Faeroes, Iceland, Greenland, and Newfoundland, could cross the Atlantic fairly reliably between about 1000 and 1300.

⁵ The oldest known true gun is from Manchuria, dating to 1288; manuscript illustrations painted in Florence in 1326 and Oxford in 1327 show much-improved versions. However, a sculpture in a Buddhist cave in Sichuan may represent a gun as early as c. 1150 (Lu et al. 1988).

⁶ East Asia, despite being the homeland of guns and oceangoing ships, did not move in this direction, probably for two main reasons. First, after the massive Sino-Japanese

This was the most violent conflict the world had so far seen, involving some of the most terrible injustices in history. But it was also the most productive war in history. Guns and ships remade caging. The world, in a sense, was shrinking, and there was no longer any way to outrun conquerors. By the end of the Five Hundred Years' War, European empires and emigrants had swallowed up half or more (depending on how exactly you count) of the planet's land and people. Trade exploded, and even the farthest reaches of Europe's empires began to see rising standards of living.

The defeated often suffered appalling violence, and yet, as has so often been the case, in the long run productive war drove overall rates of violent death down and pushed overall prosperity up. Within Western Europe and its settler colonies on other continents, barely 1 percent of the population could expect to die violently by 1913. Rates of violent death were higher in the outlying parts of the European empires, and in the worst cases (like the Americas in the sixteenth and seventeenth centuries, or the Congo in the late nineteenth century) much higher; but by the early twentieth century, even outside Europe the rate of violent death in most of the great empires was probably below 5 percent.

Similarly, standards of living rose sharply within Western Europe and its settler colonies in the nineteenth century, and by the mid twentieth century they were moving up in large parts of the empires too.

The Five Hundred Years' War was so productive that it began changing the way war worked. By the eighteenth century, productive war had pushed maritime technology and the organization of states so far that governments could, for the first time, directly control the seas. Much of the increase of wealth in the ancient Mediterranean world had come from controlling the lands around that body of water, because ancient ships could not effectively police the sea-lanes themselves. Now, though, ruling the waves began to be as important as conquering the countries that bordered on the seas.

No nation was able to win decisive control over Europe in the Five Hundred Years' War, but after its victories over the Dutch in the seventeenth century and the French in the eighteenth Britain achieved near-total naval supremacy. The result was the emergence of what we might call liberal empire, a new kind of power based on integrating societies through trade rather than political rule.

Liberal empire still depended partly on old-fashioned direct rule, incorporating defeated societies (above all India) into a political structure

war of 1592–98, East Asian governments seem to have concluded that interstate war was counterproductive (although war on the steppe frontier remained highly productive); and second, the distances on the Pacific Ocean were simply too great to make maritime empires on the European model attractive. China's ruling class seems to have reached this conclusion by the 1430s, when they abandoned state-sponsored maritime expeditions into the Indian Ocean.

ruled from London, but its wealth and power depended even more on maintaining the freedom of the seas for British commerce. The new kind of empire also produced new kinds of consequences, as the fruits of global trade created incentives that pushed British entrepreneurs into unlocking the secrets of fossil fuels, massively magnifying both the wealth of nations and their destructive power, with Britain in the lead in both areas.

But—in yet another of paradox of war—the growing importance of trade did not mean that productive war was losing its importance. Free trade could only flourish under the protection of a globocop with the power to police the whole world's oceans, and the only mechanism to decide who would be the globocop was productive war. Britain could not maintain its position if a rival used war to unite continental Europe.

Between the 1790s and 1815, Napoleon almost succeeded, killing as many as five million people in the process, but ultimately could not defeat Britain's economic power. For nearly fifty years Britain's wealth seemed unassailable, until between 1861 and 1871 productive wars and the spread of technology turned the United States and Germany into real rivals.

In the twentieth century two German bids to unite Europe by force and a similar Japanese effort in the Pacific failed, killing more than a hundred million people, but they also swept away the old European deadlock. To fight Germany and Japan, Britain had effectively been forced to sell off its maritime empire, and after 1945 two very new empires, the Soviet and the American, dominated the planet.

Each denied that it was an empire, claiming instead to be a radically new force that opposed imperialism in the name of equality (the Soviet version) or freedom (the American version), but each was very much a legacy of the Five Hundred Years' War. The Soviets brought the old style of centralized, territorial empire into the twentieth century, while the Americas did the same for the liberal version.

The real break with the past was that the twentieth century's wars had generated destructive powers that transformed the payoffs from aggression, exposing the deepest paradox of productive war. By the 1980s the two empires had enough nuclear weapons to kill everyone on earth. The only way to avoid nuclear annihilation, it seemed to many, was by forming a world government, yet the lesson of history seemed to be that the only way to form a world government was by a productive war between the two empires—a war that would necessarily be so counterproductive that it would leave cockroaches to inherit the earth. The environment had changed so much that the kinds of productive war that had shaped history for ten thousand years no longer worked.

Mutual assured destruction meant that the Soviets and Americans did not fight a Third World War. Instead, they made do with a war in the Third World. Waged mostly through proxies (murderous rural revolutionaries for the

Soviets, thuggish dictators for America), this grinding conflict left about ten million dead between 1946 and 1989.

This, however, was just a drop in the ocean compared to what would have happened if the conflict had mutated into a true Third World War. In the 1980s even a 'counterforce' nuclear exchange between the Soviets and Americans, with each side attempting to destroy the other's nuclear forces, would probably have left three hundred million dead on the first day. A 'countervalue' exchange, in which each side targeted the other's cities to destroy its ability to fight on, would probably have meant more than a billion dead over the weeks that followed.

But that did not happen, because the American Empire was perfecting a new kind of productive war: literally a war of production, waged through standards of living. As Richard Nixon and Nikita Khrushchev famously foresaw in their 'Kitchen Debate' in Moscow in 1959, washing machines and video games replaced tanks and missiles as the main weapons. It was a strange war, shaped by the fact that the two superpowers could not fight an actual war, but it also depended on America's ability to use violence to protect and police its sphere of influence. Yet it worked, and in 1989 Eastern Europe's disillusioned, downtrodden masses threw off their bungling masters. Within two years the Soviet Empire had been cast onto the ash heap of history.

The world that the American victory made was just as strange as the kind of war that had produced it. There were more independent governments in the 1990s than ever before, and yet the planet had never been so more thoroughly dominated by a single state's military, economic, and cultural power.

Conclusion

The evolution of war across the last fifteen thousand years has shifted incentives so much that traditional kinds of productive war have become unthinkable. Since the fall of the Soviet Empire, interstate war has almost disappeared, except for the occasions when the USA itself decided to wage it. Mass killing now happens almost entirely within failed states or when they export it in the forms of terrorism and civil war. The global rate of violent death has fallen well under 1 percent, far and away the lowest in history.

Further, as Pinker (2011) shows in detail, violence is becoming an increasingly unattractive option in most spheres of life across most of the planet. We are, in effect, being pushed in the bottom right-hand cell of the Pacifist's Dilemma (Figure 1).

Putting the trends of the last few hundred years into the perspective of the previous fifteen thousand, however, reveals a simpler explanation than the twenty-dimensional interaction identified by Pinker. In ancient times (and again in the last five hundred years) productive war has been the prime mover in reducing violence. War has created larger, safer, and richer societies. The

institutional, intellectual, and psychological factors that Pinker identifies are the consequences of productive war.

One conclusion we might draw from the evolution of war is that productive war will continue mutating in the twenty-first century, shifting incentives further toward peace, until at some point virtually no circumstances will remain in which violence seems profitable. At that point, the dream of a world without war will become a reality.

How exactly that will come about, though, remains unclear. The philosopher Daniel Dennett likes to say that the tools of evolution are cranes not skyhooks: that is, new adaptations are path-dependent, built from the ground up in incremental steps. Identifying the logical *telos* of an evolutionary trend avails us nothing if there's no way to get there from here (Dennett 1995: 73–80, 251–61).

I think we can see two contradictory trends at work in the twenty-first century. On the one hand, productive war has evolved faster in the last five hundred years than ever before, and when the invention of nuclear weapons made it clear that traditional productive war had become counterproductive, the United States and Soviet Union quickly worked out new ways to wage productive war. It is certainly possible that this will continue in the twenty-first century, moving the world toward being a single society without following the unthinkable path of total war.

On the other hand, as organisms and institutions evolve, they change the environment around them, which may push evolution in unanticipated directions. One possible analogy for the near future might in fact be the kind of thing that happened a hundred and fifty years ago. There was no world government in the 1860s, just as there is no world government in the 2010s. But then, as now, one state bestrode the world like a colossus. No competent nineteenth-century government would break the *Pax Britannica* without being confident that Britain would at least remain neutral in its conflicts, just as almost none now dares break the *Pax Americana*.

But by the 1870s, the very success of the *Pax Britannica* had fed back to change the environment, making it increasingly uncertain. Expensive new weapon systems were shaking up the status quo. Governments were reorganizing themselves to conscript more men and mobilize them faster than ever before. New economic giants—above all, Germany and the United States—were gaining on Britain. There seemed to be more room to take chances, and also more pressure to gamble, as doing nothing began to look riskier than rolling the dice. The result: 1914.

The world of the 2010s presents alarming similarities. The 1990s were, in important ways, like the nineteenth century gone mad. Globalization was exploding, technology was changing almost too quickly to measure, and one nation's economic and military might made productive war unthinkable. But since 2000, America's economy has stumbled. In the 2020s China's GDP will

probably overtake the United States', and the return of a multipolar world looks imminent.

As in the years around 1900, a revolution in military affairs is underway. By 2020 robotic, nanoscale, and genetic weapons will probably dominate advanced war fighting, and anti-missile systems may have made the old style of nuclear bullying obsolete. The United States currently has such a huge lead in the new, high-tech styles of war that no state dares challenge it; but so did Britain until the 1870s.

Neither China, nor Iran, nor Russia, nor Pakistan (nor any other as-yet-unidentified potential foe) is likely to seek a war with the United States in the 2010s, but Germany was not seeking a war with Britain in the 1910s either. The real problem a century ago was the perception that the *Pax Britannica* was breaking up. In such an uncertain environment it only needed a Serbian terrorist with a pistol to set the world alight. In just the same way, the real problem today is a perception that the *Pax Americana* is at risk—and we have no shortage of contemporary terrorists, armed with much more than pistols (see discussion in National Intelligence Council 2012).

In conclusion: the trends in the evolution of war across the last fifteen thousand years suggest two possibilities to me. First, we may already be reaching the point that war is evolving into something else entirely, making the age-old dream of a world of peace a reality. But second, we may be reaching a point at which productive war flips over into counterproductive war on a scale to dwarf anything the world has seen before. Either way, the next fifty years will be the most important in human history.

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