
Military Revolutions

It is widely believed that we are in a period of revolutionary change in warfare, called by its proponents the ‘revolution in military affairs’ (RMA). Military technology, the organization of the armed forces, and the nature and purposes of war are possibly in the process of being rapidly transformed. These changes seem to have come together and to have accelerated with the end of the Cold War. Some of the claims made for the RMA, that it will eliminate the ‘fog’ of war and that it will cement the permanent dominance of the offensive over the defensive are so sweeping that it is necessary to place them in context. Revolutions in military affairs are neither new nor does the present one seem to be unprecedented in scale, despite the claims of some of its advocates. The modern world has been shaped by two major military revolutions and by two significant changes in military technology that followed rapidly after the second transformative revolution.

The gunpowder revolution of the sixteenth century that coincided with the formation of the modern sovereign territorial state is the first major military revolution. The application of the industrial revolution to war that began in the mid-nineteenth century is the second. This latter revolution led to the total wars that dominated the first half of the twentieth century and that have shaped to a

considerable degree the institutions and the balance of power in the world we now inhabit. The mechanization of war and the advent of nuclear weapons followed closely in the wake of this second great transformation at fifty-year intervals. The one has defined the current conventional forces of the major powers, and the other has determined why such forces cannot be effectively used by such powers one against the other.

The causes, courses and effects of these two major revolutions have much to teach us, in particular what rapid change in military technology does to create pressures for change in armed forces, societies, and interstate relations. Technological change emerges from a set of social conditions and social pressures for new technical adaptations. It is itself caused and is not a pure exogenous force. But certain changes once set in train seem to act as if they were just such a force and oblige the ensemble of social relations around them to adapt to them. Thus specific technological innovations are closely followed by major changes in military organization and in the wider society. Such subsequent organizational and social changes are by no means simple and direct effects of the changing means of warfare. They are specific social innovations and are in turn necessary in order to realize the full power of the new weapons.¹

This chapter will focus mainly on technological change in warfare, but as it progresses it will become clear that such changes often have complex and even contradictory effects on political structures and international relations. This should caution us against predicting direct and unmediated political and social effects from the current military changes. The long period of technological stagnation between 1650 and 1850 should also remind us that technical change is not necessarily continuous. This was a period in which the defence was dominant and was coun-

teracted chiefly by social and political factors that changed the size, competence or motivation of the armed forces of one of the major powers. It may thus be possible that after a period of rapid and major change in the next half-century military technology will begin to come up against basic limitations of information and engineering technologies. A burst of radical change followed by stasis is thus perfectly possible.

In both the sixteenth and the nineteenth centuries contemporaries were well aware of the changes taking place and sought to understand and master them. The periods 1500–1650 and 1815–1950 both produce a large literature of military commentary and wider reflection on war. Intellectuals and military intellectuals struggled to come to terms with the new changes and to reconfigure them in ways they thought appropriate. The caricature view of a hidebound aristocracy unable to adapt to gunpowder weapons in the first period and a rigid military set in the Napoleonic mode unable to understand the killing power of the new weapons in the second is just too neat. Established elites proved remarkably responsive to change. War is driven by ideas about how to use weapons and military systems almost as much as it is by technical and organizational changes themselves. Ideas are thus crucial and we shall pay considerable attention to current ideas about future wars and future weapons in chapter 3. We shall be lucky to achieve the same levels of understanding and effective response as intellectuals, both military and civilian, did in earlier periods of radical change.

The military revolution of the sixteenth century

The first ‘military revolution debate’ began with the publication of Michael Roberts’s *The Military Revolution 1560–1660* in 1956 and it has produced a vast and ever-growing historical literature.² This controversy largely turns on how, where or when the revolution happened. There were huge changes in war, state and society between 1500 and 1700. Historians squabble about which changes and which specific subperiod were the most important, or they pick the whole period and say a revolution happened because things were vastly different at the end of the whole period than at the beginning. It would be tiresome to summarize this historiographical battle in great detail in a book that tries to anticipate the future, but some attention to the issues is essential. In particular it helps to challenge the excessive claims made for the political effects of the Military Revolution by many social scientists. I shall contend that the initial forces driving change were technological and that their effects were well in train before Roberts’s revolution begins in 1560. Indeed, the changes he describes can be seen as a subsequent process of adaptation of military tactics and organization to these effects and to fully exploit the potential of the new weapons.

Something radical did happen at the turn of the fifteenth and sixteenth centuries. In 1494 the French King Charles VIII led an army into Italy and in the process transformed warfare in the peninsula and began a decisive period of military change up to 1559. During this time France and the Spanish-Habsburg Empire fought for supremacy. Central to the early French success was a large siege train of modern highly mobile bronze cannon firing iron shot.

These guns rapidly demolished the fragile and often ill-maintained walls of the Italian cities and fortresses. This unlocked the positional warfare that had brought stasis to war in Italy for the better part of a century. Within a year the French had traversed the peninsula and entered Naples, an unprecedented feat. Contemporaries were well aware of this. The historian and politician Francesco Guiccardini rightly saw the French invasion as both a revolutionary form of war and a fundamental transformation of Italian politics.³

Guns, of course, were not new in 1494. They had been in use since the fourteenth century and had grown dramatically in effectiveness since the mid-fifteenth. In 1453 the Turks used cannon to breach the walls of Constantinople. In the same year the new artillery created by the Bureau brothers completed the destruction of the English position in France. This had depended on a network of castles and fortified towns laboriously acquired in the course of the Hundred Years' War. The castle and the fortified town had evolved to the point where relatively small garrisons could hold out against a large besieging force. This gave the defending state the time to mobilize a field army to threaten the besiegers and thus relieve the place. The rapid fall of place after place in the face of the new artillery overwhelmed the capacity of the English to respond with the limited field forces available to them. Warfare shifted from the dominance of the defence to that of the offensive.

What was new in 1494 was the further advanced mobility and hitting power of cannon, but what was revolutionary was the response to them. The scale of the shock in the Italian city-states set off a rapid adaptational response in fortification. Italian fortifications had been changing in response to gunpowder since the 1470s and Italian architects were the most advanced in producing new ideas. The

early sixteenth century was a period of experimentation and sustained innovation. By the 1530s the first complete examples of the new system of fortification were built and would become the accepted standard solution to artillery for the next three hundred years. This was based on curtain walls that were covered against artillery fire by being sunk behind ditches and screened by an earth *glacis*. The walls had arrowhead bastions at their corners, each capable of supporting the others nearest to it with interlocking fields of fire. Contemporaries were sufficiently aware of the source of the innovation that they called the new layout of arrowhead bastions the *trace italienne*.

What the new system of fortification did was to restore the balance between defence and offence, and then shift it back strongly in favour of the former as the century progressed. By the 1580s, wherever the new fortifications were widely adopted, warfare became a positional struggle, once again dominated by sieges. Thus the Eighty Years' War, which secured the independence of the Netherlands from Spain, was essentially an attempt by the Spaniards to break through the dense fortified belt of Dutch towns. The new siege warfare was expensive both in manpower and money. It helped to make warfare protracted and indecisive, with armies slowly marching and countermarching within the fortified zones or tied down in major sieges.

This indecisiveness of war had one major political effect; it helped to prevent the formation of an imperial hegemony in Europe. Fortifications were central in checking the Habsburg bid for mastery in Europe and also in containing the Ottoman attempt to break into Central Europe and into the Western Mediterranean. The Habsburg Empire failed to overcome the Protestant powers in Germany, and Spain failed in the Netherlands. The Ottomans were checked at two major sieges, Vienna in 1529 and Malta in 1565. Spain and the Ottomans could not fully exploit the

advantages in manpower and fiscal resources that followed from their extensive empires and turn them into a stable hegemony over other states. This ensured the survival of a population of roughly equal competing territorial states. The states system that formed coherently in the second half of the seventeenth century and that characterized Europe until the First World War thus owed a considerable amount to the underlying indecisiveness of warfare brought about in large measure by this first part of the gunpowder revolution. Lest this be thought to overstate the case, bear in mind that Spain and the Turks had numerical superiority over lesser states and were the most effective military powers of their day.⁴ Had warfare favoured the offensive, the outcome could well have been two imperial hegemonies, one Catholic and one Muslim, confronting one another.

The success of France in Italy was short-lived. In 1495 the Spaniards landed in Italy to check the French. At Cerignola in 1503 the Spanish inflicted a serious defeat on the French. They did so by using entrenched infantry armed with firearms. In a series of engagements up to Ceresole in 1544 the arquebus (an early musket) and field artillery transformed tactics. Gunpowder weapons made the defence decisive in the field as well as in the new fortifications. Combat tactics now turned around achieving a strategically advantageous position and fighting from behind prepared defences if possible. Heavy cavalry became more and more ineffective as the century proceeded. Pikes (long spears), from being a decisive weapon of war in the fifteenth century in the hands of the Swiss, became increasingly a cover for the growing numbers of arquebusiers in armies.

A minimally competent arquebusier could be produced with about six weeks basic training. Printing made simple basic training manuals available throughout Europe. They

broke down into a series of simple and easily repeated steps the actions of loading and firing a musket and handling a pike.⁵ The result was that small *cadres* of experienced soldiers and enthusiastic amateurs could quickly train large improvised armies. Such manuals helped to train the rapidly assembled armies of the English Civil War. Gunpowder weapons made soldiers easy to recruit and replace. This reduced their status. The new systems of training represented a kind of early-modern Taylorism and deskilling. The new weapons also made soldiers cheaper. This, combined with the large numbers of poor and unemployed produced by the economic changes and the price revolution of the sixteenth century, made it possible to raise larger armies. It also meant that it was possible to replace armies after a major defeat and to create rebel armies to defy hated rulers.

It is widely held that military changes in the sixteenth century increased the cost of war and thus favoured the centralization of power and the rise of the modern state. The central state was able to eliminate all lesser powers and establish a monopoly of the means of violence. This might hold true in relation to the lesser nobility, who could stretch to a few armed retainers and a run-down castle, but they had not been in the business of challenging monarchs for some time. Major wealthy cities and lesser powers had the chance with the new weapons to defy centralization or annexation. Thus the Grand Duchy of Mantua used the modern fortifications to preserve its independence during the Italian wars.⁶ The armies of the religious wars in France and Germany, of the Dutch rebellion, the English Civil War, and the various localist revolts of the mid-seventeenth century were raised in defiance of established authority and many of these challenges succeeded. The modern sovereign territorial state was formed in a century and a half of religious, localist and

social struggles in which the large centralizing powers were not always victorious. Spain was defeated in the Netherlands, so was the Imperialist cause in Germany, and so was the Stuart monarchy in England.

Gunpowder did not destroy the feudal order. Its economic and political foundations were in advanced dissolution by 1500 in Western Europe. The nobilities of Europe reinvented themselves as commercial landowners or as state servants. The new states competing against one another and struggling with internal religious conflicts and localist revolts were administratively fragile and often unable to impose anything resembling a monopoly of the means of violence. All the major states faced repeated crises of authority in the sixteenth and early seventeenth centuries. Religious conflicts divided society ideologically. Catholics and Protestants fought for dominance within states, tearing the political fabric apart, and states aided religious rebels in other countries for either ideological affinity or reason of state. The Reformation sparked off a European civil war far more extended and savage than that between Communists and Fascists in the 1930s.

However, by the mid-seventeenth century most states had mastered internal armed conflicts and had begun to control religious dissent. The French state defeated the Huguenots militarily in 1628 and had managed to overcome a series of noble and localist revolts called the Fronde by 1653. Spain defeated the revolt of the Catalans, but was unable to prevent the reassertion of Portuguese independence. England achieved a measure of political stability by restoring Charles II in 1660. The effect of the Peace of Westphalia in 1648 that ended the Thirty Years' War was to stabilize the relationship between religion and territory in Germany. Germany was the key centre of the religious wars and the 'black hole' that undermined what forms of stability there were in the emerging international system by

sucking in external powers to interfere on behalf of their co-religionists. The treaty recognized that certain states were henceforth Catholic or Protestant, accepting the balance of power as it stood, and it represented the defeat of the aim of the Imperial party to assert Catholic hegemony. The external powers that had intervened in Germany, France and Sweden, in particular, agreed to abide by the religious truce in Germany and not to interfere in the internal affairs of the member states of the Empire.

Westphalia initiates the widespread acceptance of the principle of non-interference. That principle and the corresponding obligation of mutual recognition are what make states sovereign. Each state is accepted as a legitimate member of the system without reference to ideology. Given non-interference in its internal religious affairs by other states, the state can effectively use its administrative and military capacities against internal enemies. Thus the international dimension of mutual recognition is central to the state's acquisition of a monopoly of the means of violence within its territory. Non-interference and mutual recognition require that the political entities conform to the model of the sovereign state, each of which is the exclusive controller of a definite territory.

The reason for raising these international system issues here, returning to them in chapter 2, is that they are central in explaining both the periodicity of the major states' acquisition of the capacity for external violence – why there is a dramatic change around 1660 – and the nature of the wars fought, with the shift from complex wars with mixed motives, including intervention to aid religious compatriots, to wars based on interstate rivalries. Agreements between states were crucial in fostering their capacity to control their own societies. Once they had done so they could systematize their means of violence and direct it outwards.

It would be ludicrous to derive all these changes from the gunpowder revolution. But fortresses and muskets did play a crucial role in creating the balance of power that was formally recognized in 1648. Writing in the latter part of the eighteenth century Edward Gibbon contended that gunpowder weapons had made civilized peoples secure against barbarians, thus avoiding the fate that befell the Roman Empire.⁷ Certainly gunpowder weapons vastly increased the power of European states against non-European peoples, but if anything one could turn Gibbon on his head. Gunpowder made Europe safe against anything resembling the Roman Empire, that is, the hegemony of one state.

The new gunpowder weapons were at first inserted into late medieval armies. These were mostly mercenary forces, augmented with a component of nobles and retainers serving under feudal obligations. By the end of the sixteenth century modern military organizations had begun to emerge. The most advanced were the Spanish, followed by the Dutch. The combination of pike and shot encouraged the formation of relatively small units that could coordinate fire and protection (although large pike squares continued to be formed). Such units created an articulated army capable of being deployed by strategic direction. In the sixteenth century interest in Roman military writings was widespread. The Roman legions had been the last great European army capable of being deployed tactically in organized multiple units: cohorts and centuries. In the sixteenth century most of the modern military ranks (general, colonel, captain and lieutenant) emerged.

However, most armies until well into the seventeenth century were tactically and administratively ramshackle. They were raised by states that were still fiscally fragile and could not bear the costs of large standing armies, let alone administer them efficiently. Most soldiers were mercenar-

ies engaged for a campaign by private military contractors acting on an official commission. Standing armies of disciplined troops were a creation of the later seventeenth century and most soldiers were not housed in barracks and subject to twenty-four-hour supervision until the late eighteenth century, if then. The widespread adoption of the bayonet in the 1690s enabled every soldier to become a musketeer, greatly increasing the firepower of armies. This put a strong emphasis on linear formations to maximize fire effect and, therefore, an even greater emphasis on drill in order to keep such extended lines level. This improved the firepower effectiveness of armies greatly but was not equivalent in scope to the revolution brought about by gunpowder weapons in the early 1500s.

The revolution in weapons was not paralleled by any corresponding change in the conditions of warfare. War was limited by certain fundamental constraints. First, low agricultural productivity. This limited the number of men who could be sustainably taken from civilian life into the army in normal times and, even in times of economic dislocation when there was a large surplus labour supply, restricted recruits mainly to paupers, criminals and vagabonds. More significantly, it limited the ability of armies to live off the land, even in well-developed regions like Flanders. Second, bad roads limited mobility, especially in wet weather. These two factors together meant that it was difficult to assemble more than about 30,000 men in any one region and hope to feed them successfully. Third, armies found it difficult to keep the field in winter, when food was scarce and cold and damp increased susceptibility to disease. Armies typically campaigned in the summer season and hoped to capture one or two fortified positions where they might winter. If they failed they had typically to retreat and disperse.

Weak state administrations, fiscal fragility, physical con-

straints on operations, and the bias toward the defensive made decisive campaigns difficult to sustain. Large armies could be assembled, like the 134,000 men nominally under the Imperialist command of General Wallenstein at the start of the campaigning season in 1629. But they usually soon diminished due to desertion and disease. Only a small fraction of such armies could be assembled in the field to any strategic purpose. War tended to break down into dispersed operations and sieges. At worst it became a broken-backed form of conflict in which rival bands of soldiers raided and plundered in a manner indistinguishable from banditry. The civilian population then suffered greatly as rival armies tried to live off the other's territory. The Thirty Years' War degenerated into just such a stalemate, for all the great and supposedly 'decisive' battles, like the Swedish victory over the Imperialists at Breitenfeld in 1631.

These limiting conditions were not relaxed until well into the eighteenth century. The first to be relaxed was the fiscal. The Netherlands and then England created the institutional conditions for the deficit financing of wars at low rates of interest. Investors could be certain that the Bank of England would repay its debts. Lending to the Bank became a secure investment and attracted *rentiers* and not just short-term major speculators. Britain thus enjoyed a decisive fiscal advantage in its wars with France and Spain in the eighteenth century: it could borrow more for less. Second, states began to create effective administrative machines with professional salaried staffs that enabled them to run standing armies and navies. Third, agricultural productivity increased slowly and steadily in the eighteenth century and population grew rather faster. Lastly, roads improved significantly in the eighteenth century both in the density of the network and the quality of the surfaces, at least in the most developed parts of Europe. Where a

dearth of roads hindered military mobility and state control, as in Scotland after the 1745 rebellion, military roads were built between strategic points.

Warfare was almost continuous in the eighteenth century. The major states strove for advantage in the struggles to preserve the balance of power, to gain territory, and to keep or capture profitable colonies overseas. The Seven Years' War of 1756–63 was fought in Europe but also in North America, the Caribbean and India. Yet warfare remained constrained by the fact that most states in the international system were dynastic. What transformed the limits on the scale and sustainability of operations was not a new technology, but a gradual lifting of the physical constraints throughout the century and a political revolution at its end.

Changes in war have regularly been anticipated by military intellectuals. Thus the French military reformer Jacques Comte de Guibert contended in 1772:

Only suppose the appearance in Europe of a people who should join to the austere virtues and a citizen army a fixed plan of aggression, who should stick to it, who – understanding how to conduct war economically and to live at enemy expense – should not be driven to give up by financial exhaustion. Such a people would subdue its neighbours and overthrow our feeble constitutions like the gale aquilon bends the reeds.⁸

This is exactly what happened after 1793, when the French revolutionary armies were loosed upon Europe. Key to the transformation of war made possible by the Revolution and systematized under Napoleon was the change in political goals. Dynastic states had fought for limited political advantages, typically to realize an inheritance of territory or prevent another state from benefiting from one. States

oriented to external commerce fought to seize opportunities for trade and colonies. Napoleon sought hegemony for France in Europe in a way far beyond even the ambitions of Louis XIV. He sought to subordinate or destroy enemy regimes by destroying their capacity to fight, defeating their armies in major battles. French strategy relied on the inability of ancien régime states to call forth an equivalent national resistance. Second, the Revolution made possible conscription, the *levée en masse*, greatly increasing the number of available troops. Conscription pushed military participation up to the limit of social sustainability. Ancien régime states typically paid mercenaries to fight, they faced severe fiscal constraints, and they had a limited religious and dynastic bond between rulers and ruled. Having less legitimacy and less coercive power than the Revolutionary regime, they could not draw as deeply on the lives and property of their peoples.

Napoleon used the new mass armies to side-step the network of fortresses. Aiming ultimately at the enemy's capital, he sought to destroy their main field army. The French advanced on a broad front, in several dispersed columns, each of about 30,000 men. This strategy used the road network and food supplies to a maximum. Each column had sufficient power to defend if attacked. The aim was that they would converge on a strategic point and overwhelm the enemy, as Napoleon did in 1805 at Ulm and 1806 at Jena.

Napoleonic warfare encountered three fundamental obstacles that ensured that the French bid for hegemony in Europe failed. First, in Spain and Russia the French campaigned in countries where the old limitations on warfare reasserted themselves: poor roads and low agricultural productivity. These countries were not merely materially backward, they were also socially far enough behind that the population was immune to the revolutionary mess-

age. Spanish traditional elites and the peasantry alike rallied in defence of the old social order against Enlightenment modernization imposed from Madrid. Russian serfs likewise rallied to Tsar and Church. Second, in Germany the French victories set off a nationalist response that gave Prussia a spurt of reform that renewed social and military institutions. It was reinforced by a popular pan-German revival against the French, rallying pusillanimous conservative elites to the people rather than the other way round. Thirdly, the chief commercial power, Britain, was beyond the reach of French armies and was able to subsidize the continental powers. With the end of the Napoleonic bid for European hegemony, 1815 restored not merely the traditional rulers but also a world of medium-sized territorial states governed by balance of power considerations.

The period after 1815 produced what is still the most profound reflection on war, Carl von Clausewitz's *On War*.⁹ Clausewitz combined the experience of the Napoleonic system of warfare with the world of states restored by the peace of Vienna. Clausewitz's large work can be summarized in some key propositions. War is in essence a combat, reciprocal action between two opponents. To win one must anticipate, match, and overwhelm one's opponent. War tends to escalate to extremes (to what Clausewitz called absolute war) but all actual operations are threatened by the unanticipated difficulties and obstacles that Clausewitz called 'friction'. Reciprocal action and friction mean that military operations cannot be planned bureaucratically; they require imagination, initiative, morale and willpower. War thus demands talents and virtues on the part of soldiers, and superior morale and will-to-win can be decisive. War principally involves disciplined military forces. The true aim of operations should be to destroy the enemy's capacity to fight. This involves

seeking decisive engagements. War takes place between states. It is, as Clausewitz says, 'the continuation of policy by other means'. Soldiers are thus servants of the state; they try to realize the ends of their political masters but in a specific medium with its own logic. Equally, policy-makers have to accept the distinctiveness of military affairs and let soldiers win wars in the only way they can. The defensive is the strongest form of war and it can only be overcome with superior numbers and a willingness by soldiers to sacrifice their lives. Modern war thus implies mass armies and the creation of forms of legitimacy that will tie soldiers to the regime.

Clausewitz defined a military doctrine for a world of competing states, each of which followed a foreign policy dictated by reason of state, but in which, if they were to be militarily effective, there were forms of inclusive political order that tied soldiers to their state. These features of Clausewitzian war held good well into the twentieth century. Nationalism tied mass armies to the state and offered a wider focus of loyalty than the old dynastic regimes, even if the nation-states were still monarchies. War did remain the continuation of policy. All states were following classical reason of state considerations in 1914. They got into a war that could only be ended by brutal attrition, but in which the Clausewitzian emphasis on morale and staying power proved decisive. Even Hitler's war could, at the outset in 1939, be presented as an attempt to recover Germany's losses in the First World War and to renew its bid to be the dominant power in Europe. Clausewitz's division of labour between soldiers and politicians survived in a new form adapted to the necessities of total war. The industrialization of war inevitably brought politicians into military strategy, and military objectives had to be conditioned by economic constraints. Equally the militarization of industry forced generals to become politicians and man-

agers. Where politicians crossed the line and began continually to direct operations, as Hitler did after 1941, the results were disastrous. Equally, where the military gained control over political ends and the civilian economy, as Hindenburg and Ludendorff did after 1916, the results were mostly dire too. The modern commander as manager (mediating between generals and politicians and balancing the conflicting demands on grand strategy) is exemplified by Eisenhower in 1944–45.

War in the industrial age 1850–1918

The innovations of the sixteenth-century gunpowder revolution were finite. Once they were accomplished the pace of technical change slowed down; there was no process of continuous revolutionary technical innovation. The same could largely be said about innovations in military organization after the formation of standing armies and the administrative and fiscal infrastructure necessary to support them in the later seventeenth century. The major transformation in military organization, mass conscription, was not universally adopted and did not become general until the latter half of the nineteenth century. England and Russia did not adopt it and the French themselves dropped it after 1815 and did not revert to it again until after 1870. Between 1550 and 1850 military technology underwent gradual and incremental evolutionary change. It was much more effective towards the end of the period, but the basic weapons were essentially the same. To illustrate the point, a sailor from the English ships of the Armada campaign in 1588 would have been quickly at home in the ships that fought at the battle of Trafalgar in 1805. Likewise, a soldier from the sieges of the Italian wars of the sixteenth

century would have understood exactly what was happening at the siege of Badajoz in Wellington's Peninsular campaign in 1812. The musket of the Napoleonic Wars differed little from that of the late seventeenth century and achieved only modest increases in hitting power and range over the arquebus. Muzzle-loading cannon in 1800 were more effective than in 1600 but their range and the practical upper limits of weight of shot were about the same. Warships were propelled by sails and fought with broadside-mounted cannon. Bastioned trace fortresses were still being built in the early nineteenth century.

From 1850 onwards, however, the industrial revolution rapidly and continuously transformed war. The *Dreadnought* of 1905 would have been all but incomprehensible to a sailor from the *Victory* of 1805. For example, it had a practical maximum range some twenty times greater and projectiles some twenty-five times heavier. A soldier from the English trenches before Sebastopol in the Crimean War of 1854 would have found the German destruction of the Belgian ring of concrete forts around Liège in 1914 equally beyond comprehension. The siege guns of 1854 could fire shells of 30kg some 400 metres maximum effective range to batter walls. Krupp howitzers could fire shells weighing 1 tonne some 6,000 metres to destroy several metres of reinforced concrete. War changed utterly in its basic technologies in the thirty years between 1850 and 1880. Weapons were typically obsolete before they had entered service. Military leaders and military intellectuals struggled to adapt. For all the castigation of aristocratic military conservatism by modern scholars it is a miracle that they managed to do so at all. Again, as in the early sixteenth century, the changes were driven by new technologies. What was different this time was that technical change was not confined to weapons – in fact the main forces transforming war were production and communi-

cation technologies – and also that technical change was continuous and cumulative.

In the first half of the nineteenth century a cluster of innovations revolutionized the physical conditions of war: canning, railways, steamships and telegraphs. Canning enabled armies to store food better and to supplement biscuit with protein. This enabled them to assemble food in advance and lessened their dependence on local food supplies. Armies could now fight in areas devoid of local food supplies, as in the Crimea or the Wilderness Campaign in the American Civil War. Adequately fed armies could survive winter campaigning too. Railways trebled the speed of movement and vastly increased carrying capacity; they also greatly extended the distance over which troops could be moved and supplied. This made possible the mobilization of mass armies and their delivery to the frontier in a short time. Once they left the railhead, armies returned to the old conditions of movement, limited by the pace of walking with heavy kit and the speed of the horse-drawn supply wagon. The German attack on France in 1914 involved swift mobilization by rail up to the Belgian border. Thereafter, the army had to walk. It failed to meet its targets, falling behind the timetable in the Schlieffen Plan and short of Paris. This enabled the French to mount a last-minute counterattack.

Railways transformed war *within* continents. They had the effect of greatly reducing the advantage that had hitherto prevailed in favour of seaborne as against landborne trade. The result was to make the interiors of continents like the USA or Russia fully exploitable. This was to increase the relative economic strength of land-based powers as against seaborne empires. However, this is not to deny the importance of the revolution in maritime transport that took place in the second half of the nineteenth century. Steamships transformed both maritime commerce

and intercontinental warfare. Previously, for example, it had normally taken up to six months to reach India with sailing ships, and arrival was uncertain, since ships could find themselves becalmed. Once coaling stations were in place the journey could be done in as many weeks and reliably. Intercontinental warfare had existed in the sailing ship era. What steam did was to make it possible to transport and supply mass armies overseas. Without it the world wars of the twentieth century would have been impossible. In particular, American armies could not have been supported across the Atlantic and Pacific. The armies that operated outside Europe in the sailing ship era were small. The forces that fought in the North American interior in the eighteenth century were tiny. In India the European powers created armies out of local sepoys and expanded their control by intervening in local conflicts. Their armies were fed and paid for within the subcontinent.

Without the telegraph, railways were only of limited use. Telegraphs coordinated movements and integrated the separate lines into a network. They also made the control of army movements possible, as close as cable could be laid to the front. Once the intercontinental telegraph cables were laid across the Atlantic and to Asia from the 1870s, European powers could control the movements of fleets and armies across the world. The telegraph made possible strategic, and thus political, direction and greatly reduced the scope of local military control. By 1914 local commanders could also bombard their front-line troops with instructions by field telephone. The telegraph set up the conflict between central strategic direction and local front-line knowledge that has persisted to this day, and which the modern Revolution in Military Affairs is supposed to dissolve. The adoption of radio in the years immediately preceding 1914 further increased the capacity to control

from above, particularly in allowing commanders to communicate with ships at sea.

One more thing was needed totally to transform war, new forms of firepower. This came in the 1850s with the widespread adoption of the Minié rifle. This was still a muzzle-loader, but one capable of firing accurately out to 1,000 metres. This transformed combat. Even with a slow firing weapon the effective killing zone increased from about 100 metres to 500 metres. The effects were clear in the American Civil War. The Confederate charges at Gettysburg in 1863 were classic examples of Napoleonic élan; their complete destruction showed just how much the already considerable power of the defensive had been reinforced. The mass armies of the Union were armed with Minié rifles. The new lethality was combined with mass production.

Since the War of 1812 between the USA and Britain American military administrators had been seeking standardized and interchangeable weapon parts. The initial reasons were a concern with uniformity and ease of repair. Standardization was achieved by division of labour, specialized machine tools and precise measuring instruments. These innovations made mass production possible. Three decades of experiment by American officers, a long process of trial and error at government arsenals, created a system of industrial efficiency that was then quickly applied by Colt to revolvers, Singer to sewing machines, and McCormick to agricultural machinery. This American system of manufactures, as it was called in Britain in the nineteenth century, was the basis of the mass armies and industrialized killing of the twentieth.

The coincidence of new technologies facilitating mobility, the widespread adoption of mass conscription, and mass-produced weapons of long-distance lethality created a deadly combination. It ensured that the defensive would

be by far the stronger form of warfare and that masses of men would be fed into prolonged battles of attrition in an attempt to overcome it. This was not immediately apparent in the period 1850–1900, not because military leaders were unaware of the effect of the new weapons, but because wars were of short duration, like the Franco-Prussian War of 1870–1. All minimally rational officers realized that the problem was how to cover several hundred metres through a hail of bullets. In an encounter battle the outcome would be decided by the side that prevailed in the initial firefight. Against dug-in infantry the only option was to take heavy casualties. The Russo-Japanese War of 1904–5 seemed to confirm this lesson, but also the possibility of achieving a result. The Japanese had suffered massive losses in storming the fortress of Port Arthur, some 20,000 men killed, but they had shown superior will and had prevailed. The intense but short blood sacrifice seemed justified by the strategic importance of the place. Military intellectuals in the period before 1914 sought to assimilate such lessons from combat and to find ways to make the offensive possible. In the case of the Germans it was to use the tactical defensive in a scheme of strategic advance based upon swift mobilization. In the case of the French it was reliance on relentless human wave attacks sustained by high morale.

Between 1850 and 1880 firepower was transformed far beyond the Minié rifle. Rapid-firing breech-loading rifles increased the rate of fire about ten times. From the 1860s a series of machine guns was introduced, the most effective being the Maxim of 1885 that was fully automatic and capable of firing several hundred times a minute. Field artillery was also transformed by 1900. It increased greatly in range (from about 1,000 to 6,000 metres), in rate of fire (from 1 to up to 15 times per minute) and in the lethality of shells with new high explosives.

What these changes ensured was that, after a short

period of encounter battles, warfare between evenly matched forces with a reasonable ratio of force to space would turn into a linear siege. The tendency, started at Cerignola four hundred years before, was to entrench and defend, thus exploiting the firepower of the new weapons. The mass production of barbed wire made such temporary fortifications all but impregnable. This outcome, which produced the attrition war of 1914–18, was anticipated by some intellectuals well before 1914. Many pacifists believed war had become too costly to sustain. Prolonged war would wreck complex interdependent systems of trade and finance. This was a common proposition adopted by antiwar liberals like Norman Angell and Marxists like Rudolf Hilferding. Ivan S. Bloch, a Polish banker living in Paris and writing in 1897, made it plain that a major war could now only be an extended bloody struggle that would destroy existing civilization. Bloch claimed: ‘Everybody will be entrenched in the next war. The spade will be as indispensable to a soldier as his rifle. . . . All wars will of necessity partake of the character of siege operations . . . soldiers may fight as they please; the ultimate decision is in the hand of famine.’¹⁰

Bloch was prescient. Hunger did play a major part in deciding the First World War. Both sides tried to starve one another out, the Allies with blockade and the Germans with submarines. The Germans seemed to have starved themselves, food shortages figuring prominently in the collapse of morale among civilians and the consequent revolt of the Fleet in 1918. But Bloch and other liberal commentators were wrong about the inevitability of economic collapse. Commercial civilization *was* fragile. Industrial societies were far more robust. The economic losers in 1914–18 were Britain and France. They had built up their position of commercial strength throughout the nineteenth century and had become *rentier* nations, having

accumulated large stocks of foreign investments. Britain and France were by far and away the major creditor nations in 1913, with stocks of overseas investments of \$18 billion and \$9 billion respectively.¹¹ By 1913 Britain's share of world trade had fallen to 15 per cent but it remained the world's financial and commercial hub.¹² The UK had by far the largest merchant fleet in 1914. It was the centre of the world's markets for commercial bills and insurance. Britain was the lynchpin of the world monetary system based on the Gold Standard. All these assets were exceedingly prone to disruption by war, and the world economy was almost as integrated as it is today.

In 1918 the USA emerged as the main creditor nation, having been the principal debtor in 1913. Britain and France had incurred some \$3.7 billion and \$2 billion respectively of inter-government debt to the USA.¹³ Britain lost 25 per cent and France 50 per cent of their prewar foreign investments.¹⁴ This was crucial for Britain, since income from investments and other invisibles had offset its balance of trade gap before 1914. Britain lost major foreign markets to non-European competitors during the war (more than half its trade was outside Europe and North America in 1913).

If Britain and France were the main losers from the disruption of commercial civilization, the United States was the clear economic beneficiary of the war. This basic change in the balance of economic power has lasted until the present day. During the war all the major combatants harnessed industrial production to the needs of war, adopting whatever financial and fiscal expedients were necessary to supply the fronts. Industry was converted wholesale to military production. Britain and France benefited from being able to draw on the immense productive capacity and food output of North America. Germany was barred from such a source by blockade and its limited access to

foreign credit, and forced to utilize its own resources. In all three countries the state took over the management of the economy and the direction of industrial production. Industrial employers, organized labour, and the government cooperated to find means of maximizing output, such as relaxing labour regulations and rationing raw materials. Germany effectively mobilized industrial production but it failed to ensure an adequate supply of food to the civilian population in the later years of the war. It allowed the big agrarian landowners to make excessive profits and the army to requisition excessive amounts of food and horses. Germany failed effectively to exploit its control of a large part of the grain production of Eastern Europe during 1917–18. Britain survived its own food crisis because its system of rationing was fairer and because it was finally able to master the U-boat blockade in 1917–18 by adopting the convoy system for merchant ships.

The economic effects of prolonged war brought about by the new weapons of the late nineteenth century contributed considerably to the economic instability of the period 1919–39, which itself contributed to the renewal of war in 1939–41. The liberal economists of the prewar era were right in that it proved prolonged war had indeed destroyed the open international economy of the *belle époque*. Despite a widespread return to the Gold Standard in the 1920s, it proved impossible to put the old economy back together again. Inflation throughout Europe during the war made it difficult to sustain the old pre-1914 parities to the dollar. The USA failed to sustain the fragile debtor economies of Central Europe. With the Great Crash of 1929 economies across the world went down in the wake of the USA. Britain went off the Gold Standard in 1931 and abandoned free trade for protectionism. The 1930s turned into a struggle between rival protectionist trade blocs for access to raw materials and markets.

Mechanized war 1918–1945

During the First World War the airplane and the tank were introduced as combat weapons. After the war visionary military intellectuals such as J. F. C. Fuller and Giulio Douhet saw them as a way of breaking the deadlock created by firepower and mass production. Fuller initially saw tanks as a kind of land navy, overcoming the obstacles of the front and manoeuvring freely in the enemy's rear. Tanks would render the opponent's armies ineffective and strike at command centres and supply lines. Douhet foresaw aircraft overflying the deadlocked front lines, bombing civilian centres in the rear and reducing the population to terror. Civilian panic would bring down governments and thus end wars. Bombing was like a fast-acting version of blockade.¹⁵

In fact Fuller and Douhet were too visionary since neither of these technologies was fully mature before the 1940s and neither ever worked as the prophets thought they would. Both technologies had evolved with astounding rapidity since the introduction of the internal combustion engine in the 1890s, but that was part of the problem. In the case of land vehicles civilian automobile industries did not develop fast enough to enable the mass production necessary for fully mechanized war. In the case of the airplane its effectiveness depended on other, unrelated technologies that would enable it to find and hit its targets, and these were still in development in the 1930s.

Tanks were not in fact like landships. They were not an independent weapon but part of a whole military system that included infantry, artillery and supply services. The German *Blitzkrieg* victory in France in 1940 would seem to gainsay this. However, the success of the Panzers was

possible because of a mixture of faulty Allied strategy, poor French morale, and cumbersome command structures. It should be remembered that the French had as many tanks as the Germans, but failed to use them effectively. Massive tank assaults could be contained, as the Russians proved at Kursk in 1943. In 1940 the only country with a civilian motor industry large enough to be capable of producing the vehicles for a wholly motorized mass army was the USA. The German army that invaded Russia in 1941 relied on railways for its strategic mobility and on horses for the tactical mobility of about 80 per cent of its forces. Even the American forces in France were hard put to sustain their advance to the German border in 1944. Given the speed of their advance and the destruction of the rail network, they were dependent on fuel carried on trucks to support their armoured spearheads. This supply chain proved inadequate, even when vast numbers of vehicles were diverted to the purpose.

Tanks and planes depended on radio for their coordination. Without it they would be merely of isolated and local use. In the 1930s the invention of radar shifted the balance between defence and offence in the air in favour of the former. Radar-controlled fighters by day forced British and German bombers to operate at night. They found it difficult to find and hit targets as big as major cities. They caused damage but failed to halt war economies, and, contra Douhet, they failed to damage civilian morale – if anything they raised it. Only in 1944–5 did Anglo-American air power prove effective. By then American fighters had begun to control the air by day. Radar navigation and bomb aiming made British mass bomber raids on cities effective. The targeted destruction of the German railways and oil industry wrecked the German war economy far more effectively than the bombing of manufacturing plants themselves. Against weak Japanese

air defences mass American fire-bombing raids destroyed entire urban centres. Indeed, Hiroshima and Nagasaki were selected as targets for the atomic bomb because they were among the few Japanese cities of any size that were not completely burnt out.

Given the right conditions, air superiority could thus prove decisive. It could cripple the movement of armies by day and it could damage the war economy. America and its allies have relied on control of the air as their key asset, along with a near monopoly of naval power that enables them to move around the world, ever since. Allied armies were able to compensate for their relative weakness against the Germans by means of air power. They sought to do the same when confronted with the Soviets, seeking to counter numerical superiority with better weapons.

The conventional armed forces of the Cold War were shaped by the experience of the final phase of the conflict in Europe. They brought mechanization to full technological maturity. The platforms that have dominated modern war such as the Abrams tank or the F15 fighter are essentially highly evolved versions of late 1940s technologies. The aviation and motor industries became the core of military mass production after 1945, and tanks and jet planes were turned out in the thousands until the costs of technical evolution cut down production runs from the 1960s onwards. The massive mechanized armed forces of the Cold War were never used in all-out combat in Europe. From being core war-winning weapons, they turned into a form of reinsurance that deterrence would not fail. They prevented conventional thrusts under the nuclear umbrella, establishing a trip-wire and indicating resolve. The forces that fought the Gulf War and that enforced the peace in Bosnia were designed for an impossible all-out battle in central Europe. As we shall see in chapter 3, they may not be the best adapted for future wars.

The advent of nuclear strategy

Nuclear weapons made a fundamental difference to the nature of war because they undermined its rationality. Heretofore, war was a means to an end. It could be highly profitable, as were most of Britain's wars in the eighteenth century or the USA's participation in the two world wars in the twentieth. Nuclear weapons made the rapid escalation to absolute war likely, that is, a generalized exchange in which both the states and societies of the contending powers were destroyed. Nuclear weapons removed the constraints that had limited the destructiveness of war. But, far from reinforcing the offensive, these weapons led to military stalemate. These weapons undermined any possible political objective that their use could serve. The object of nuclear strategy became the paradoxical aim of using the threat of force to avoid war. If nuclear weapons were used, then political strategy had failed. In this case the political effects of this innovation in military technology were fairly direct.

This was recognized immediately after Hiroshima. Bernard Brodie, as prescient as Guibert or Bloch, saw that nuclear weapons had changed the fundamental principles of war between states armed with them: 'Thus far the chief purpose of a military establishment has been to win wars. From now on its chief purpose must be to avert them. It can have no other useful purpose.'¹⁶ Deterrence would give time to work out a political accommodation on the part of the nuclear powers, but it could be no more than that, certainly not a stable condition. Generals were slow to understand this fact that war had changed its nature. Both American and Russian nuclear forces were seen by their militaries into the early 1960s simply as very powerful

weapons that in principle could be used. The USA and the USSR did not share a common doctrine of deterrence, but it became clear to politicians that nuclear war would mean the end of civilization. Certainly after the Cuban missile crisis they became profoundly cautious and avoided not merely nuclear threats but situations that could lead to direct military confrontation at the core of the two blocs of states. Deterrence extended beyond nuclear war to other forms of war. War became impossible, but in highly armed societies. The Cold War presented a fundamental paradox. Nuclear weapons had abolished hot war, and thus undermined the solidarity that comes from fighting a genuine enemy, but they did not produce peace. People lived in fear of a nuclear holocaust, a fear heightened during periods of tension between the blocs. This fear did not lead to national solidarity, but to a diffuse terror on the part of powerless individuals.

Hence the immense relief during the periodic 'thaws' during the Cold War and the tendency of the USA and USSR to return to dialogue and détente after relatively short periods of tension. The dialogue between Reagan and Gorbachev ended the Cold War and thus the fear of a generalized nuclear exchange. This reduction of nuclear tension continues, not because Russia has ceased to be a nuclear power, but because it has ceased to be an ideological one and because it is neither willing nor able to contend with the USA for world power. Russia's vital interests are currently confined within its own borders and in the 'near abroad'. It will only make serious nuclear threats if challenged on that terrain.

In the 1960s guerrilla warfare was seen by many commentators, left and right, military and political, as a new form of war that could take place despite the nuclear deadlock, and that threatened the West and its allies. It was directly linked to a new politics of national self-

determination and anti-capitalist revolt in the periphery. In fact guerrilla war was not new. It was practised in Spain against Napoleon's armies. It relied then too on an asymmetry between local forces able to merge with the population and alien regular forces based in urban centres. As Mao in China and Giap in North Vietnam realized, such warfare could only be effective as a revolutionary tactic as part of a wider strategy of 'people's war'. This required that the political strength of the urban elite could be undermined, and, in consequence of such political defeat, that guerrilla tactics could be combined with those of a standing revolutionary army. It was this combination that led to Communist victory in the Chinese civil war in 1949 and to the collapse of the South Vietnamese state.

Guerrilla war is not an exclusive 'technology of the left'. It was used as a tactic by the American-supported rebels in Afghanistan, by Renamo in Mozambique, and by the Contras in Nicaragua. In each of these cases, rightist guerrillas, mostly professional mercenaries, enjoyed external support in pursuing a political strategy of using guerrilla tactics to destroy leftist 'civil society' in the countryside. The strategy was largely destructive, undermining health and education projects, and crippling agriculture. Leftist governments proved powerless to check them by conventional military methods and urban society proved too fragile a prop for the regime. Guerrilla war is a specific and limited form of war. Its success depends principally on the balance of political forces, and also on whether there is a powerful conventional 'sponsor', such as the Duke of Wellington in the Peninsula War or the Reagan government for the Contras. Guerrilla war became fashionable in the 1960s precisely because it was sponsored by the superpowers in their proxy struggles in the Cold War and also because of the stubborn resistance of states like France and Portugal to the end of colonialism.

Nuclear war, however, remained the dominant form of war, the one that shaped the core strategies of the most powerful states. Because nuclear war rendered war impossible between the advanced countries, it limited the direct impact of war on society. Mass mobilization of the home front was not required. The absence of conventional total war made possible a restoration of limited government in Western societies. The atomic bomb could in that sense be said to have made the world safe for liberalism, for without it the likelihood of a major conventional war between the superpowers in the half-century after 1945 was very high. Such a war would have probably kept the Soviet Union going. It would have provided a real enemy and thus a source of solidarity, and a situation in which a centralized command economy functions best. The current political situation is thus very much a product of the nuclear age. Nuclear weapons contributed significantly to the 'civilianization' of modern societies. Until nuclear weapons are diffused to other powers with intercontinental capacity and a reason to confront the USA, this is one of the fundamental continuities that carry forward into the twenty-first century.

The legacy of the military revolutions

There are other continuities that stretch even further back. From Cerignola to the Gulf the effects of successive military revolutions have been conserved within existing military systems. Conventional warfare has continued to exhibit a strong defensive bias based upon firepower. When in difficulty soldiers entrench and go underground. Permanent professional military forces remain. They are divided into units like battalions and companies, com-

manded by officers with traditional ranks like colonel and captain. Despite technological change, the basic infantry combat unit is still the battalion of 500–800 soldiers. Certain forms of organization thus remain tenacious. So, at the macro level, does the system of competing states. Indeed, it has been reinvigorated by the breakdown of the conflict between the superpower blocs. The USA is the sole remaining superpower, but its hegemony is neither comprehensive nor based on a project of direct conquest and control, unlike previous bids for power within the system by Spain, France and Germany. Since the industrial revolution changed war, it is transportation systems, communications technologies and weapons platforms that have been central to its effective conduct. This is even more the case today. Nuclear weapons are also still there in their silos and submarines.

However, just as the limitations on preindustrial war were removed by the industrial revolution, so some of the most constraining features of industrialized war are now passing away. During the Cold War mass armies based on conscription remained. Now they are obsolete in the advanced countries. The legacy of the *levée en masse* is over. Large numbers of soldiers with only basic skills and weapons add little to modern conventional war. Mass armies persisted in the advanced states because the Soviets still believed in the strategic offensive and the use of overwhelming numbers in successive waves. They kept reserve formations and obsolete weapons to throw in if needed, regardless of casualties. Western armies kept large orders of battle in order to respond to this threat.

Not only are mass armies obsolete in the advanced countries but so is that other feature of mass industrialization, total war. Total war was an effect of the stalemate on the battlefield. In a war of attrition the only option is to bleed the enemy into surrender, and to do so it is necessary

to release as many combatants for the front and to produce as many weapons as possible. In order to do this civilian society must be militarized, all labour and resources being subject to central state control. All states adopted this strategy in the two world wars of this century. States, liberal and illiberal, were forced to use broadly similar methods. Indeed, the experience of 1914–18 convinced many that state socialism was both possible and efficient. This did not mean, as many believed in the 1930s, that authoritarian states were bound to be able to mobilize resources more efficiently than liberal ones and were thus likely to prevail over them. It turns out that total wars are not necessarily most effectively fought by totalitarian states. Nazi grand strategy and the German war economy were both badly managed. Liberal states proved more effective at managing total war economies than the fascist states. The reason is that they were able to rely on a combination of efficient, fair and lawful central state direction, the voluntary cooperation of big business in running the war effort, and a high level of support and sacrifice from citizens. In 1918 and 1945, war economies were more or less rapidly dismantled in the liberal states.

Such wars of attrition are currently less frequent. This is both because the disparity of forces is often such that wars are over rapidly, as with the Six Day War of 1967 in the Middle East, and because the political aims and, therefore, the military commitments of wars are more limited, as with NATO's campaign in Kosovo. Total war derived from military stalemate, but in the context of the goal of the total defeat of the enemy. Where both stalemate and unlimited war aims recur, as in the Iran–Iraq War, then so do some of the features of total war (although neither state was fully industrialized). Multistate wars will be unlikely to return to the scale of mass mobilization of 1939–45 for the foreseeable future, both because most of the states capable

of fighting them are likely to have, or be capable of developing, weapons of mass destruction (no power with the nuclear bomb can lose a war of attrition), and because the economic and political causes of an unlimited conflict on the part of most major states do not currently exist. Either nuclear deterrence will cut in if there is an acute crisis, or the opposed parties will cut a deal. This means that, for the advanced states, we are returning for the next couple of decades at least to a condition rather like the liberal era for the Western powers between 1850 and 1890. States are limited governments; they make minimum military demands on their societies; the great powers will tend to cooperate in a crisis rather than fight; and the military will be subject to rapid technological change.

Since the sixteenth century the defensive, based on firepower, has tended to be by far the stronger form of war. This dominance of the defence has been punctuated by periods in which one state introduced new weapons and military methods that gave it a distinct but brief offensive advantage. Examples are the introduction of mass conscription in revolutionary France and German skill in mechanized warfare at the beginning of World War Two. These advantages have been rapidly removed as other states have adopted the same weapons and methods, or have used alternative means to counter them. Sometimes too there have been periods of major inequality in military power between different types of states, for example, that between European armies and non-European peoples in the period of high colonialism in the nineteenth century. The USA has a similar massive advantage today in both weapons and overall military skill over all other states. This is an unusually long period of offensive dominance for America and its allies. This may not last and changes in military technology may reinforce the defensive and thus reduce the offensive superiority of the USA.

War has a future. There is no danger of universal and perpetual peace breaking out in this century. Liberal states fight, they use force to impose their will. There will be multiple sources of conflict outside the advanced world. We shall return to the prospects of new wars and for yet another military revolution in chapter 3.