

THE REVOLUTION IN MILITARY AFFAIRS: MYTH OR REALITY?

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TABLE OF CONTENTS

1	Introduction: MTR and RMA	4
1.1	RMA and Military Science	5
1.1.1	The Theoretical Hierarchy	5
1.1.2	The Organizational Hierarchy	7
1.1.3	Offence and Defence	9
1.2	Terminology: Military Revolutions and RMAs	10
2	Past “Revolutions in Military Affairs”	12
2.1	The Late Medieval RMA	14
2.2	The Early Modern Military Revolution (1500-1660)	15
2.3	The Industrial and French Revolutions	16
2.4	The First World War	17
2.5	The Second World War	18
2.6	The Nuclear Military Revolution	19
2.7	Subsequent “Potential RMAs”	22
2.7.1	SDI	22
2.7.2	Conventional War Planning	24
2.8	Lessons from the Past (?)	27
3	The New RMA: Background	27
3.1	The Vietnam War	28
3.2	The War against Iraq	30
3.3	From Improvisation to Planning to Uncertainty	32
3.4	Military Planning in the Nineties	34
3.4.1	The Bottom Up Review 1993	34
3.4.2	The First Quadrennial Defence Review 1997	36
3.4.3	The Second Quadrennial Defence Review 2001	38
4	RMA Themes	39
4.1	The Information Revolution	40
4.2	Information as a Force Multiplier	40
4.3	War in the “Information Dimension”	42
4.4	Principles of War of the Information Age	45
5	RMA and U.S. Campaigns since 1991	47
5.1	Somalia 1992-93	47
5.2	Bosnia and Kosovo	48
5.3	Iraq 1998	51
5.4	The War against the Taleban	52
6	Military Challenges of the Future	54
6.1	Traditional Wars	54
6.2	“Uncivil Wars” and Peace Support Operations	55

6.3	Homeland Defence and the War against Terrorism	56
7	Conclusion	57
8	Endnotes	57

1 INTRODUCTION: MTR AND RMA

Technology affects all walks of life. It should therefore come as no surprise that it may have profound implications for the ways in which wars are fought.

Recent years have seen an accelerating technological development, especially with regard to information technologies, sometimes referred to as an “information revolution”. Not only has this produced the internet and a proliferation of mobile telephones (and to some extent their combination), affecting the lives of most citizens of the industrialised countries. The new technologies also have obvious military relevance as they increase by several orders of magnitude the capacities for data collection, interpretation and dissemination, thereby allowing for long-range precision strikes, real-time battle management, around-the-clock combat operations, etc.

The military potential derived from these capabilities was demonstrated by the victorious war of the US-led coalition against Iraq in 1991, at least according to official U.S. accounts (*vide infra*). Many observers and military planners have drawn the conclusion from this experience that we are presently midcourse in an ongoing “military-technological revolution” or a “revolution in military affairs” (RMA), perhaps even a fully-fledged “Military Revolution”.¹ The theory of the RMA rests on, among others, the following assumptions:

- ? that technological supremacy will be decisive, in the sense that “the best weapons win”;
- ? that information dominance will be decisive;
- ? that air power (and in the future perhaps “space power”) will be decisive, in the sense that future wars may be fought almost entirely from the air or even space;
- ? that the importance of geography and topography will therefore decline, i.e. that war will be “deterritorialised”;
- ? that surgical precision will be achievable, especially by means of air strikes, hence that collateral damage can be minimized and wars waged in full conformity with “just war” criteria;
- ? that determined offensives, initiated by air strikes, will be able to break through all defences.

To the extent that states subscribe to these beliefs, they will also reach the conclusion that the time has come for short and offensive high-technology and high-intensity wars.

In the following, the above assumptions will be subjected to critical scrutiny on the basis of both past experience with presumed “revolutions in military affairs” and assumptions about future war. As a prelude to this, however, a certain theoretical and terminological clarification seems warranted.

- ? At which level(s) in the hierarchy of military science should the effects of RMA be visible?
- ? How do we distinguish “revolutions” from ordinary changes?
- ? What is the relative importance of technology among the several determinants of military power?

As the RMA is very much an American phenomenon the United States remains the focus throughout.

1.1 RMA and Military Science

1.1.1 The Theoretical Hierarchy

Military science (or “art”) is a unified body of thought, based on experience. At each level it is a matter of assigning means to achieve ends which are defined a level “above”. This makes military science, by its very nature, hierarchical as well as “amoral” in the sense that is supposed to accept ends as given rather than passing moral judgement on their legitimacy or even legality.²

The exact hierarchical order of military science, however, has always been somewhat ambiguous. As set out in Table 1, Western military theory, at least until recently, applied a simple dichotomous ordering of military science into strategy and tactics, plus an ill-defined notion of “doctrine” (as in the FOFA or AirLand Battle doctrines, *vide infra*). Soviet military science was more systematically ordered, dividing its subject matter roughly into four parts: “Doctrine” as the political assignment of military means to political ends (i.e. roughly comparable to “grand strategy”), “strategy” as the application of military means to these objectives, “operational art” as the science of major operations within vast “theatres of military action” (TVD: *teatr voennykh deystviy*),³ and finally “tactics” referring to the activities of individual formations in single

engagements.⁴ It seems that, since the late 1980s, Western terminology has come to resemble the former Soviet one with the addition of the levels of “grand strategy” and “operational art”—the former ranking “above” strategy in the terminological hierarchy and the latter in an intermediate position between strategy and tactics.

Table 1: The Hierarchy of Military Science		
<i>“Old” Western Terminology</i>	<i>Soviet Terminology</i>	<i>New Western Terminology</i>
Politics	Politics	Politics
n.a.	Doctrine	Grand Strategy
Strategy	Strategy	Strategy
“Doctrine”	Operational Art	Operational Art
Tactics	Tactics	Tactics

- ? **Politics** falls beyond military science, but defines the purpose (*Zweck*) of the latter, in conformity with Clausewitz’s conception of war as “the continuation of politics by other means”,⁵ including the definition of the “national interest”.⁶
- ? **Grand Strategy** is more or less synonymous with security policy, i.e. it defines the ends of the State and the relative importance of military and other means to these ends, depending on various assumptions, e.g. on the likelihood and nature of future confrontations.⁷
- ? **Strategy** is about fighting and winning wars. It was defined rather narrowly by Clausewitz as “the use of engagements for the objectives of war”. His successors have tended to define the subject in somewhat broader terms, e.g. as “the distribution and application of military means to fulfil the ends of politics” (Liddell Hart), or “the art of applying force in order to attain the ends of politics” (André Beaufre),⁸ both of which also encompass the “use” of military force for deterrence and threat diplomacy.
- ? **Operational Art** could be tentatively defined as the art of fighting and winning campaigns in a large theatre of war.⁹ It is thus more or less synonymous with what Jomini called “grand tactics” (whereas he used the term “strategy” for what we would today call operational art).¹⁰
- ? **Tactics** is about fighting engagements and battles, i.e. about “the use of armed forces in combat”, according to Clausewitz.¹¹

Some definitions of RMAs or “military technical revolutions” (MTR)

emphasise that they merely affect the two lower rungs of the “ladder”, i.e. tactics and operational art, while others claim that the revolutionary changes also pertain to strategy or even grand strategy—for which some analysts reserve a different term, namely “military revolutions” (MR).

The so-called “principles of war” (PW) form a the set of (presumably) perennial verities about how to fight both battles, campaigns and wars, which were first referred to by Jomini and subsequently codified by J.F.C. Fuller.¹² In a more modern version, formulated by Trevor Dupuy, there are nine such principles:

- ? *Objective*: Every military operation must be directed toward a decisive, obtainable objective
- ? *Offensive*: Only offensive action achieves decisive results.
- ? *Simplicity*: Simplicity must be the keynote of military operations.
- ? *Unity of Command*: The decisive application of full combat power requires unity of command.
- ? *Mass*: Maximum available combat power must be applied at the point of decision.
- ? *Economy of Force*: Minimum essential means must be employed at points other than that of decision.
- ? *Maneuver*: Maneuver must be used to alter the relative combat power of military forces.
- ? *Surprise*: Surprise may decisively shift the balance of combat power in favor of the commander who achieves it.
- ? *Security*: Security is essential to the application of the other principles of war.¹³

Most authors seem to assume these principles of war to apply to all levels of military science, albeit with the connotations differing from level to level. It is thus possible to argue that a presumed MR, MTR or RMA affects the concrete implications of the principles of war and even their relative importance, while maintaining that the principles as such retain their validity. However, other authors (e.g. Lt-Col. Robert Leonhard) have argued that some of these principles have been invalidated by the “information revolution” and that, indeed, this revolution has retrospectively revealed some of them to never have been valid, more on which in due course.¹⁴

1.1.2 *The Organizational Hierarchy*

To the hierarchy of ends and means, represented by military science, corresponds a hierarchy of “who is in charge of what ” (See

Table 2).

- ? Politics is, by its very nature, the domain of the State—in most democracies with a certain division of powers between the executive and the legislature.¹⁵
- ? Grand strategy is usually the prerogative of the executive, sometimes with a certain involvement of the upper echelons of the military hierarchy, i.e. the general staff (in the United States, the Joint Chiefs of Staff, JCS).¹⁶
- ? The development and execution of strategy is usually the prerogative of the military, represented by the general staff, the various services (Army, Air Force, Navy and perhaps special services such as the US Marine Corps) and sometimes the upper echelons of the operational commands (e.g. fleets or army groups)—where we also find the phenomenon of inter-service rivalry.¹⁷
- ? Operational art and tactics are usually the domain of military field commanders, from field marshals down to platoon leaders.

Reality, however, is less neat than this. History is replete with examples of political leaders interfering with the actual conduct of wars (or even operations). Perhaps the RMA will make this more, rather than less frequent, because top commanders, including the President, will be able to communicate directly with forces on the battlefield, in their turn organised as a network, rather than a hierarchy.¹⁸

Table 2: Hierarchies of Command and Instruments		
<i>Military Science/Art</i>	<i>Responsibility</i>	<i>Instruments</i>
Politics	Government, Legislature	Economy, industrial structure
Grand Strategy	Government	Demography, sociology Strategic Culture
Strategy	General Staff, Service, Corps commands	Military posture
Operational Art	Corps, Army, Fleet commands	System of Systems Corps and armies, Fleets
Tactics	Regiment, Company, Battalion commanders	Weapons, logistics, “Systems” Troops

Alongside the hierarchy of command and responsibility is one of **instruments**, i.e. of troops, weapons, command-and-control and

other support systems. At the lowest levels, this is a matter of weapons systems and “systems of systems”, while at the higher levels of aggregation it is more or less synonymous with “military posture”. The latter might be likened to “frozen strategy”, as it reflects how political decision-makers and practitioners envisioned fighting the next war at the various points in time when the decisions producing the posture were taken.¹⁹ At the levels of grand strategy and politics it is a matter of the ability to field, equip and use armed forces. This is determined, e.g., by economics, industrial structure, demography and sociology as well as by political choices between, for instance, conscription or all-volunteer armed forces²⁰—but “strategic culture” also plays a role.²¹

1.1.3 Offence and Defence

Important components of military science, at all levels, are assumptions about the relative strengths of offence and defence, which impact decisively on, e.g., the penchant for war.²² If states believe in offensive supremacy, i.e. expect offence to be easy and victory swift, they will be more inclined to go to war than if they hold to opposite opinion.

This was illustrated by the fatal consequences of the predominance of such beliefs around the beginning of the 20th Century, manifested in, among others, the German “Schlieffen Plan” and the French “Plan XVII”, the combination of which led to (or at least contributed to) the outbreak of the First World War.²³ That these beliefs were proven completely wrong was cold comfort for the millions of soldiers who were killed in futile attempts at breaking through the defences of the other side, mostly along the Western front—as had been accurately predicted by the Polish banker Ivan Bloch.²⁴

On the other hand, erroneous beliefs in the strength of the defence may have almost equally disastrous effects, as they may induce complacency in states which believe that “defence is easy” (as implied by the pejorative term “Maginot Line mentality”). They may further weaken such alliance bonds as might otherwise help preserve the peace.²⁵

In principle, distinctions may be made at all levels of the above theoretical hierarchy of military art and science, as well as be applied to military postures (See Table 3). It is, of course, perfectly conceivable that states may combine offence and defence from the

different levels, e.g. that a defensive grand strategy may be combined with an offensive strategy; or that an offensive strategy may envisage an extensive resort to defensive tactics and/or operational conceptions. It is also entirely possible that the offence may be superior at one level and the defence at another, for instance that there may be offensive supremacy with regard to nuclear weapons, but defensive supremacy in the conventional realm or parts thereof, say with regard to air power.

Table 3: Offence and Defence	Offensive	Defensive
Grand Strategy	“Compellence” Attack	Deterrence National defence
Strategy	Pre-emptive attack Border-crossing counter-offensives	Territorial defence
Operational art	Breakthrough operations Deep strikes (<i>vide infra</i>) “Deep operations” (<i>vide infra</i>)	Envelopments Retreat
Tactics	Counter-attack	Counter-attack Reactive defence
Posture	Long reach Strategic mobility Mobile logistics	Short reach Tactical and operational mobility Dispersed depots

If the RMA does indeed, change the relative balance between offence and defence (as seems to be the prevailing assumption) this might warrant labelling it a genuine revolution.

1.2 Terminology: Military Revolutions and RMAs

For something to constitute a genuine revolution it will surely not suffice to allow for achieving the same results by means of different instruments or in a slightly different fashion. Rather it would have to allow for either achieving hitherto unachievable political ends or for achieving such ends by fundamentally different means. Hence a true revolution should presumably affect all levels of military science, at least those below grand strategy, i.e. strategy, operational art and tactics.

Three different terms are often encountered, and sometimes used as (near) synonyms:

- ? “Military-Technical Revolution” (MTR) was the original term, used e.g. in the USSR as well as by some US military planners (especially in the Office of Net Assessment) to highlight the consequences of (military as well as civilian and dual-use) technologies for the conduct of war.
- ? “Revolution in Military Affairs” (RMA) is defined somewhat broader, but usually still pertains to the domain of tactics and operational art (perhaps even strategy), but certainly not to grand strategy.
- ? “Military revolution” (MR), however, is a concept suitable for the grand strategic level, defined by military historians Williamson Murray and Macgregor Knox as follows:

Military revolutions (...) fundamentally changes the framework of war (...) Military revolutions recast society and the state as well as military organizations. They alter the capacity of states to create and project military power. And their effects are additive²⁶

Table 4: Terminology: MR, RMA and MTR		
Theoretical Level	Term	Practical Level of Influence
Grand Strategy	Military Revolutions	Economy, industrial structure, Demography, sociology, Strategic Culture
Strategy	Revolutions in Military Affairs	Services, Army groups, Fleets, etc
Operational art	Military-Technical Revolutions	System of Systems Corps and armies
Tactics		Weapons, logistics, “Systems” Troops

There are various definitions of “RMAs”, but none that is authoritative. Andrew Marshall of the aforementioned Office of Net Assessment (and sometimes described as “the father of the RMA”—or, at the very least, of the term)²⁷ defined RMAs as “Fundamental, far-reaching changes in how advanced militaries either plan to conduct, or actually prosecute, military operations.”²⁸ In his 1995 testimony to the Senate Armed Services Committee he elaborated on the concept:

The term “revolution” is not meant to insist that change will be rapid (...) but only that the change will be profound, that the new methods of warfare will be far more powerful than the old. Innovations in technology make a military revolution possible, but the revolution itself takes place only when new concepts of operations develop, and, in many cases, new military organizations are created.²⁹

Other authors, however, advocate different (and incompatible) concepts, some of which refer to the strategic and grand strategic levels, while others impact only on the tactics and operational art:

An RMA is a major change in the nature of warfare brought about by the innovative application of technologies, which, when combined with dramatic changes in military doctrine and operational concepts, fundamentally alters the character and conduct of operations (Paul Davis, RAND).³⁰

An RMA involves a paradigm shift in the nature and conduct of military operations which either renders obsolete or irrelevant one or more *core competencies* of a dominant player, or creates one or more new core competencies, in some new dimension of warfare, or both (Richard O. Hundley).³¹

All of these definitions refer to the operational level of war, a relationship elaborated upon by Murray and Knox:

Revolutions in military affairs are periods of innovation in which the armed forces develop novel concepts involving changes in doctrine, tactics, procedures, and technology (...) And revolutions in military affairs take place almost exclusively at the operational level of war. They rarely affect the strategic level, except insofar as operational success can determine the larger strategic equation ... Moreover revolutions in military affairs *always* occur within the context of politics and strategy—and that context is everything.”³²

One might thus see a link between the claims that an RMA is in progress and the reinvention (or re-discovery) of the operational level of war in the late 1980s.³³

2 PAST “REVOLUTIONS IN MILITARY AFFAIRS”

The present is not the only time in military history when decision-makers have believed that a “revolution in military affairs” was in progress. In some cases, however, they have exaggerated the importance of innovations, while in others they have underestimated it, i.e. ignored an actual revolution. In order to thus place the present

RMA (if so it is) in a historical context, a brief and inevitably superficial review of previous (real or imagined) revolutions seems in order.

In most cases, new technologies played a certain role, but it was rarely specifically military technologies which made the difference, but rather the general technological level. Moreover, revolutionary effects were only attained when the economic and societal framework allowed for this and when strategic thinking had “digested” the new situation, usually after several victorious or lost wars.³⁴ Generally, defeats have proven more powerful spurs to innovation than victories.

As wars are, by their very nature, contests of wills (hence profoundly dialectical),³⁵ there have never been uncontested revolutions, but would-be “wonder weapons” or “strategies to defeat all other strategies” have always called forth counter-measures. Hence, true revolutions have only revealed themselves after several rounds in the “strategic interaction”, and they have all eventually been undone, either by countervailing revolutions or simply by “wear and tear”.

Table 5: Past Military Revolutions and RMAs

Period	Military Revolutions	RMAs
17 th Century	A. Modern state and modern military institutions	1. Dutch and Swedish tactical reforms, French tactical and organisational reforms, naval revolution, British financial revolution
Late 18 th -19 th Century	B. French Revolution	2. French military reforms (after Seven Years' War)
18 th -19 th Century	C. Industrial Revolution	3. National political and economic mobilization, Napoleonic warfare
Early 20 th Century	D. First World War	4. Financial and economic power based on industrialization
		5. Technological revolution in land warfare
		6. Revolution in naval warfare
		7. Combined-arms tactics and operations, Blitzkrieg, strategic bombing, carrier and submarine warfare, radar and signals intelligence
Mid-Late 20 th Century	E. Nuclear Weapons and Ballistic Missiles	8. Precision reconnaissance and strike, stealth, revolution in C ³ I, increased lethality of conventional munitions

Williamson Murray and Andrew Knox list five military revolutions in the modern era, accompanied by several RMAs (See Table 5).³⁶

2.1 The Late Medieval RMA

It is debated whether what took place in England in the 14th Century during the reign of Edward III constitutes an RMA or not. What might warrant this label was, above all, the fact that it allowed the Plantagenets to score decisive victories against their opponents. This, in turn, was apparently due to a number of innovations.³⁷

In the realm of military technology, gunpowder was used for the first (recorded) time in 1327 (at Crécy). Equally important, however, was the extensive use of more potent forms of longbows which were capable of penetrating the armour of mounted knights. At the same time, the armour of the English knights was strengthened, and horse-breeding had been improved with the result that heavily armoured knights were now able to fight on horseback (even though this happened rarely). Neither of these new (or improved) technologies

were, however, decisive.³⁸

The decisive changes occurred in the realm of politics and organisation, where the monarchy fielded, for the first time, a genuinely standing army composed of troops on its own payroll, which allowed it to expect disciplined battlefield behaviour, even though most troops were foreign mercenaries.

New infantry tactics (“Dupplin Tactics”) were also employed, creating synergies between the massive dismounted infantry and flanking archers, with the cavalry playing merely a secondary role, for mounted pursuit of vanquished and retreating or fleeing forces. For this ability to defeat opponents in battle to have any revolutionary effects, however, strategic schemes to bring about such battles were indispensable, for which purpose the English armies used sieges of major cities combined with destructive raids (“*chevauchée*”) through the countryside.³⁹

2.2 The Early Modern Military Revolution (1500-1660)

What took place in the early modern period, culminating in the Westphalian Peace of 1648 was probably a military revolution rather than a “mere” RMA,⁴⁰ heralding a new era where politics and war (in Europe, at least) became the exclusive domain of the State.⁴¹

It certainly included various innovations in military technology such as the use of new and lighter guns (i.e. the birth of a genuinely mobile field artillery), innovative forms of fortifications and siegecraft, etc.⁴² However, none of these technologies were truly revolutionary. What made a real difference was the rather the way in which armies were raised, in turn based on the greatly expanded economic power of the State (the “fiscal State”).⁴³

Rather than relying on ad hoc levies of peasants and mercenaries on short-term contracts, standing armies made their first appearance on a massive scale, either in the form of mercenaries on long-term contracts (i.e. trained military professionals) or of conscripts, as used by the Swedish King Gustav Adolph or by Cromwell in his “New Model Army”.⁴⁴ These troops were drilled extensively—a technique employed especially by Gustav Adolph, perhaps the greatest “captain” of his time.⁴⁵ Moreover, armies simply became larger and much more disciplined than ever before, trained to operate in linear formations, but generally in smaller units.⁴⁶ These changes were accompanied by a wealth of systematic (and partly “scientific”) strategic thinking, setting

out tactical and strategic conceptions for how to use the new military tools⁴⁷—and by a systematic training of officers and to some extent even NCOs (non-commissioned officers).⁴⁸

This was thus a genuine military revolution, the main elements of which were aptly summed up by Michael Roberts:

By 1660 the modern art of war had come to birth. Mass armies, strict discipline, the control of the state, the submergence of the individual, had already arrived; the conjoint ascendancy of financial power and applied science was already established in all its malignity; the use of propaganda, psychological warfare, and terrorism as military weapons was already familiar to terrorists, as well as to commanders in the field. The last remaining qualms as to the religious and ethical legitimacy of war seemed to have been stilled. The road lay open, broad and straight, to the abyss of the twentieth century.⁴⁹

2.3 The Industrial and French Revolutions

While the late 18th and early 19th century certainly saw improvements in military technology (e.g. in terms of infantry weapons such as flintlock and bayonet-equipped rifles and field artillery featuring smoothbore, muzzle-loading cannon)⁵⁰ none of these innovations were really revolutionary. What did matter, however, was the scale on which the new weapons could be introduced as a result of the industrial revolution (coming to fruition in the first half of the 19th Century)⁵¹—in its turn a precondition for equipping and arming the new, vastly expanded, armies of the age.

Another precondition for these mass armies was, however, a profound transformation of the State as such, from one based on dynastic succession to one based on popular sovereignty and organized on the basis of democracy, as heralded by the French Revolution of 1789/1793⁵². To this was gradually added the (likewise novel) forces of nationalism, in their turn both unsettling vast multinational dynastic empires (such as that of the Habsburgs) and releasing new energy and mass.⁵³

This allowed for mobilising a very large part of the total population for war, either as soldiers or in various support functions. Only now did genuinely universal (male) conscription become possible, first manifested in the French *Levée en masse* of 1793.⁵⁴ which was orchestrated by “Le Grand Carnot”, in charge of military affairs under the *Comité du Salut Publique* of the Revolution and later Minister of War under Napoleon.⁵⁵ In the wake of the French achievements, and partly necessitated by the need for an adequate

defence against the French armies, other European states also adopted various forms of conscription, albeit often reluctantly because of the almost inevitable implications thereof in terms of civil and political rights for the population from which to draw the prospective conscripts.⁵⁶

As a result of these economic and societal changes, war changed as well. The main change was quantitative, as war expanded in several dimensions. Armies became much larger and were able to march much longer distances and fight far more intensive and destructive battles. Arguably, war thus became “total”,⁵⁷ even though the age also saw a resurgence of *Kleinkrieg* or people’s war, most famously manifested in the Spanish guerilla struggle against Napoleon.⁵⁸

Both with regard to total and guerilla war, the era further saw a flourishing strategic thinking, with authors such as Clausewitz and Jomini.⁵⁹

2.4 The First World War

Even though Napoleonic war may have appeared “total” to contemporaries, in terms of destructiveness it was dwarfed by the two world wars of the twentieth century. As a prelude to this several new technologies, both military and civilian, had reached maturity, i.e. had been introduced on a mass scale and been properly understood and “digested” by military planners.⁶⁰

New firearms, especially the machine gun, produced a significant increase in the accuracy and rate of fire. As was demonstrated in the Crimean War (1854-56) and the American Civil War (1861-65),⁶¹ this tended to strengthen the defence over the offence, as was noted by Ivan Bloch. His predictions for the future of war were proven remarkably accurate when the large offensives of the First World War proved incapable of overrunning entrenched defenders protected by barbed wire and armed with machine guns.⁶² That the machine gun also had offensive use against more primitive opponents had already been demonstrated in Africa, during the infamous “scramble” by the European powers, where the saying of Hilaire Belloc had proved right: “Whatever happens we have got//The Maxim gun and they have not.”⁶³

While the tank made its first appearances in limited roles in WWI, it had virtually no impact as nobody understood how to use it—even though the offensives of 1918 saw some of those deep

penetrations for which tanks were later to prove eminently suitable.⁶⁴ While aircraft were available and used in the course of the war, they had no significant impact, as they were mainly used for reconnaissance purposes, as well as for (rather indecisive) air-to-air combat.⁶⁵

Even more important than the new weaponry was the “railway revolution”, which had already impacted on both the American Civil War (1861-1865) and the Franco-German War (1870-71).⁶⁶ It allowed for a rapid transfer of large numbers of troops and large amounts of munitions and equipment over long distances—albeit mainly on “interior lines”, thereby probably strengthening the defence.⁶⁷ Combined with the vast mobilization potentials available after a thorough industrialisation, it contributed to the formulation of rigid and inflexible war plans by the major general staffs prior to WWI which, in their turn, made war well nigh inevitable once one side embarked on mobilisation.⁶⁸

As all general staffs (erroneously) expected swift and decisive offensives—most prominently in the German “Schlieffen Plan” and the French “Plan XVII”—these plans contributed to a war which none of the main warring parties really wanted, but which was started by the Germans, mainly as a preventive war.⁶⁹ Contrary to expectations, the initial offensive soon grinded to a halt, followed by trench warfare on a massive scale, where the stalemate was frequently interrupted by huge, but inconsequential, offensives of immense proportions and with unprecedented death tolls.⁷⁰

2.5 The Second World War

Among the novel features of the Second World War two stand out, namely the German use of *Blitzkrieg* and the extensive use of strategic bombing, particularly on the part of the allies.

The theory of *Blitzkrieg*, i.e. of deep (i.e. operational or even strategic) penetrations by means of thoroughly mechanized forces, featuring tanks with air support, is usually associated with the name of J.F.C. Fuller, but Basil Liddell Hart, Charles De Gaulle and various German officers and strategists also played a role,⁷¹ as did Soviet officers such as Tukhachevskii and Triandafillov (*vide infra*) whose ideas were transmitted to the Germans under the auspices of their clandestine collaboration in the interwar period.⁷²

The German armies achieved stunning initial victories with their *Blitzkrieg* strategy featuring deep offensive thrusts into enemy

territory with their (only partly mechanised and armoured) divisions, skilfully combining tank forces with the use of aircraft, both for air support, strategic bombing and occasionally even for “compellence” (against Czechoslovakia).⁷³ The defensive strategies, modelled on the experience from WWI, adopted mainly by the French (exemplified by the Maginot Line) and capitalized on by the Brits—resulting in their military disengagement from Europe⁷⁴—proved incapable of stopping the German military “steamroller”. Nor was the defensive strategy adopted by the USSR after the purges of the thirties any real match for the Nazi armies, but the Soviet Union was mainly saved by its climate and strategic depth combined with some innovative tactics adopted after the German attack.⁷⁵

Perhaps even more importantly, the Second World War saw the first extensive use of air power. Prior to the invention of aircraft there had certainly been talk of the military use of balloons and the like,⁷⁶ as well as an unsystematic and indecisive use of aircraft in WWI. However, not until the interwar years did air power theory really come of age, with strategists such as Giulio Douhet, Hugh Trenchard, Billy Mitchell and others.⁷⁷ Their vision was that of decisive victories through “counter-value” bombardment of cities and other civilian targets from the air which would presumably enforce capitulation.

A precondition for such aerial bombing raids, however, was the achievement of air command (or at least air control), which was what the famous “Battle of Britain” was mainly about.⁷⁸ After some initial hesitation (manifested e.g. in the preference for daylight over nocturnal bombing raids), both the allies and the Axis powers used strategic bombing on an extensive scale, culminating in the bombardments of Hamburg and Dresden in Germany and Tokyo in Japan,⁷⁹ where the first two nuclear weapons were also dropped on Hiroshima and Nagasaki in August 1945.⁸⁰ The effect of these massive bombardments, however, remains controversial to the present day. For instance, the US strategist Bernard Brodie referred to them as “unequivocally a failure”.⁸¹

2.6 The Nuclear Military Revolution

The advent of nuclear weapons should probably count as a military revolution, as it arguably affected not only operational art and strategy, but also grand strategy in the sense of redefining the possible ends to which military power could henceforth be employed

as a means. As formulated by Bernard Brodie in *The Absolute Weapon*, “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”.⁸²

However, it took a rather protracted learning process for this verity to become generally accepted. The first decades of the nuclear era were thus characterized by a US-Soviet “race to overkill”, where each side sought to match, and preferably surpass, the other in terms of megatonnage, numbers of warheads and numbers, ranges and accuracies of delivery systems—and where strategists struggled with the problems of how to work out credible strategies for the use of nuclear weapons.⁸³ In quite a few instances, the actual use of nuclear weapons was seriously contemplated, and the threat of use employed as a tool of crisis management⁸⁴—and there were always some strategic thinkers believing to have found the recipe for military victory by nuclear means.⁸⁵

Gradually, however, the impossibility of controlling nuclear use once the threshold had been crossed became generally acknowledged. Combined with the growing appreciation of the utterly unacceptable consequences of a nuclear war (most dramatically in the “nuclear winter” hypothesis of the 1980s),⁸⁶ strategists thus came to clearly emphasize deterrence over war-fighting.

In their quest for “stable deterrence” based on mutual assured destruction (MAD),⁸⁷ however, strategists also encountered problems with how to maintain the “delicate balance of terror” (as Albert Wohlstetter labelled it).⁸⁸ This called for attention being paid to deployments and the technical features of nuclear weapons and delivery systems. What mattered for each side was to minimize any vulnerability to first strikes and thus protect their second-strike capability, but this also called for consideration of how matters might look from the other side. It thus made sense to abstain from acquiring any first strike options, which would only provoke counter-measures on the part of the opponent, whose need for a second-strike capacity should thus prudently be respected. This in turn pointed towards secure and invulnerable forms of deployment, e.g. on submarines.⁸⁹

Gradually the accompanying risks of accidental nuclear war were also acknowledged, e.g. stemming from problems with C³I (command, control, communications and intelligence) and of the potentially malign interaction between the two sides’ warning and

alerting procedures.⁹⁰ All this made arms control seem a necessary companion of defence planning, as it would be much easier to assure the stability of MAD via mutual agreements than through unilateral decisions.⁹¹

This meant neither that deterrence was inherently stable nor that both sides were relaxed about it. On the contrary, occasional “scares” about alleged “gaps” surfaced and/or new scenarios were produced about “nuclear blackmail” and the like, leading to new rounds in the nuclear arms race.⁹² There were also occasional lapses into “old thinking” with attempts at breaking the nuclear stalemate, i.e. of replacing MAD with “NUTS” (Nuclear Utilization Target Selection), as formulated by Spurgeon Keeny and Wolfgang Panovsky, e.g. by devising formulas for limited (and preferably victorious) nuclear war.⁹³ Eventually, however, such attempts were invariably abandoned as futile in favour of pure deterrence. As formulated by former Secretary of Defence Robert MacNamara, “Nuclear weapons serve no military purpose whatsoever. They are totally useless—except to deter one’s opponent from using them.”⁹⁴ The most recent “Nuclear Posture Review” in the United States (*vide infra*) may cast some doubt on this, but judging from past experience its “nuclear optimism” will eventually give way to a more realistic “pessimism”.

The Soviet military and political leadership was somewhat slower in coming to this realization than their US counterparts, but gradually their nuclear strategy came to resemble that of the US.⁹⁵ The resultant nuclear stalemate had profound implications for the entire military domain, at least as far as the nuclear powers and their allies were concerned.

First of all, both sides had to guard against the risk of inadvertent spill-over from the conventional to the nuclear realm, i.e. of causing a nuclear war through escalation from conventional war,⁹⁶ which induced a general caution in the military interaction between the two superpowers, both of which went out of their way to avoid any direct military confrontation with the respective other. Whether reciprocal nuclear deterrence was thus responsible for “the long peace” remains contested, but it was probably a sufficient (but not necessarily a necessary) condition thereof.⁹⁷

Secondly, the very presence of nuclear weapons in the military equations of the two superpowers and their allies (i.e. was McGeorge Bundy called “existential deterrence”)⁹⁸ profoundly transformed the conventional realm by embedding it in a “sub-

nuclear setting”.⁹⁹ Just as nuclear weapons could not be used to win wars, conventional forces could no longer be used for this purpose, as each side might avert defeat by “upping the ante” and crossing the nuclear threshold. Wars could simply no longer be won decisively, which was indeed revolutionary.

2.7 Subsequent “Potential RMAs”

While the nuclear revolution was thus a genuine military revolution, none seem to have occurred since then, even though there have been several potential candidates for the status of RMAs, affecting the operational (and perhaps strategic) level in a profound manner. All of them were spurred by the wish to somehow break the nuclear stalemate, i.e. undoing the nuclear military revolution, but all of them eventually failed in this attempt, as was the case of the Strategic Defense Initiative (and its predecessors), the “Ogarchov Revolution” and various other conventionalisation plans.

2.7.1 SDI

The Strategic Defense Initiative was launched in 1983 by U.S. president Ronald Reagan, but not out the blue. On the contrary, ever since the first deployment of nuclear weapons of intercontinental range, both the United States and the Soviet Union had been exploring possible escapes from the looming MAD stalemate based on mutual vulnerability.

The USA has seen extensive deployments of traditional air defences, intended to intercept long-range Soviet bombers as well as civil defence programmes intended to minimize the damage inflicted by whatever might get through. After the role of aircraft had been taken over by missiles (ICBMs and SLBMs deployed on submarines, i.e. SSBNs) the search for strategic missile defences (i.e. ABM: anti-ballistic missile defences) commenced, initially based on conventional radar systems and missiles.

The USSR deployed (and still maintains) such a limited “old-fashioned” (and, almost certainly, useless) ABM system around Moscow.¹⁰⁰ Without exception, however, these plans were abandoned by the United States in recognition of the insurmountable technical obstacles to a missile defence and the unfavourable balance between measures and counter-measures. It was simply much easier (and cheaper) to design missiles with

warheads some of which would get through (e.g. by means of MRV or MIRV) than to devise a system which could be certain to intercept all of the incoming re-entry vehicles.

Certainty was exactly what the side attempting the break the stalemate would need, as attrition rates which might look formidable in the conventional realm were meaningless when applied to nuclear weapons. With strategic nuclear stockpiles around 1972 (when the first SALT Treaty was signed)¹⁰¹ comprising between 4,000 and 6,500 warheads on the US side and between 2,200 and 2,500 on the Soviet side¹⁰² even a truly impressive interception rate of, e.g., a hypothetical 95 percent would mean that the United States would have to reckon with 125 nuclear weapons landing on its soil—which would obviously be tantamount to an unprecedented national catastrophe.

In recognition thereof, the two superpowers realized that vulnerability was a fact, leading to the signing of the ABM Treaty in 1972 (as a companion of SALT I) prohibiting, with a couple of specified exceptions, the deployment of strategic defences against ballistic missiles.¹⁰³

What made strategic defences appear promising in the early 1980s, when President Reagan reinvigorated the old plans in his “Star Wars” speech of March 1983¹⁰⁴ was a number of apparent technological breakthroughs, e.g. in the realms of sensors, data processing, laser and space technology.¹⁰⁵ Their combination apparently allowed for basing components of the system in orbit (thereby allowing for boost-phase and mid-course intercept), for using intercept systems with velocities several magnitudes higher than those of the object to be intercepted, and for sophisticated battle management.¹⁰⁶

SDI was thus indeed a potential RMA. Eventually, however, it soon had to be acknowledged that the dream of an impenetrable shield was entirely unrealistic—mainly because it would not be “cost-effective at the margins”.¹⁰⁷ What remained were some plans for components of the SDI, which were significantly less demanding, but also much less interesting. Arguably, “the game simply was not worth the candle”.

? The GPALS plan of President Bush (senior) for a “Global Protection against Limited Strikes” promised a protection against unauthorised launches (e.g. from Russia) or deliberate attacks from small states such as North Korea, Iran or Iraq. While this

might well have been technically feasible, few observers at the time could take the alleged threats seriously.¹⁰⁸

- ? Plans for ATBM (anti-tactical ballistic missiles) defences¹⁰⁹ against the threat from Soviet conventional (as well as nuclear-armed) short-range (i.e. “operational-tactical”) missiles, etc.¹¹⁰— against which NATO, incidentally also contemplated a symmetrical counter, i.e. the FOTL (“Follow-On to Lance”).¹¹¹

Whether these plans would have come to fruition if the Cold War had continued beyond the 1980s is impossible to tell.

After the end of the Cold War, of course, the missile defence debate has experienced a renaissance with the US plans for a National Missile Defense, directed against “rogue states” which *might* acquire ballistic missiles with ranges allowing them to target the United States and *perhaps* armed with nuclear warheads or other weapons of mass destruction (WMD).¹¹² The European allies, however, are not exactly pleased about the plans, sharing neither the alarmist threat assessments nor the technology optimism of the USA.¹¹³ We shall return to this new round on the missile defence debate in due course.

2.7.2 Conventional War Planning

In the late 1970s Soviet military planning, under what one might call the “Ogarchov Revolution”, and partly under the inspiration of the interwar military thought of Tukhachevskii, Triandafillov and others,¹¹⁴ began to exhibit new and potentially revolutionary features pertaining mainly to the operational level, i.e. to large TVDs. Soviet planners apparently developed plans for large-scale conventional offensives, featuring deep offensive thrusts into the depth of NATO territory, inter alia with a view to neutralising NATO’s nuclear options.¹¹⁵ These deep operations were mainly to be undertaken with ground forces, especially the large, self-contained Operational Manoeuvre Groups (OMG), but also using special forces (e.g. *Speznaz*) for “*desant*” operations, and with preparatory and supportive strikes being launched by the aforementioned conventional ballistic missiles.¹¹⁶ Apparently, the USSR had abandoned its previous conviction that a war would automatically become global as well as nuclear in favour of a belief that escalation could be contained if only the Soviet forces struck sufficiently fast and deep, thereby perhaps even achieving strategic results.¹¹⁷

NATO, in its turn, had for a long time neglected conventional force planning in general, and especially the operational dimensions thereof, in favour of nuclear deterrence, but the Soviet reorientation forced NATO planners to think carefully about an appropriate, and preferably conventional, counter-strategy. What pointed in the same direction was the growing dismay over NATO's nuclear strategy, *in casu* the flexible response strategy of 1967, the logic of which had led to the controversial 1979 decision to deploy a new generation of intermediate-range nuclear missiles in Europe.¹¹⁸ As a consequence thereof, as well as of other seemingly ominous nuclear innovations, a multi-faceted debate was by the early 1980s in progress over NATO's entire nuclear strategy.

One element in this debate concerned NATO's implicit strategy of being the first to cross the nuclear threshold, i.e. the No First Use (NFU) debate, which was launched by the American "Gang of Four", comprising four prominent former US officials: Robert MacNamara, McGeorge Bundy, Gerard Smith and George Kennan.¹¹⁹ While nothing came of their proposal for conventionalisation or NFU, a consensus gradually developed within the Western alliance on the need for a somewhat higher nuclear threshold, i.e. for "No Early First Use" (NEFU).¹²⁰ Proponents of NEFU were split between two opposing camps, advocating offensive and defensive options, respectively, but both camps envisaged an extensive use of new and emerging military technologies.

In the offensive camp were advocates of various forms of "conventional deterrence", mainly emphasizing the potentials of "deep strikes", rather similar to the aforementioned Soviet plans,¹²¹ albeit to a greater extent based on "emerging technologies".¹²²

- ? Samuel Huntington and others advocated "conventional retaliation", i.e. deep (counter-)offensives with ground forces into Eastern Europe as retaliation after a Soviet attack—and in the expectation that the prospects of losing its "empire" would deter any Soviet aggression.¹²³
- ? The US Army planned along rather similar lines, albeit with a somewhat lower level of ambition, when it in 1982 abandoned the doctrine of "Active Defence" in favour of the more offensive "AirLand Battle" (ALB), heralded by the publication of a new edition of its Field Manual no. 100/5 on *Operations*.¹²⁴ The ALB doctrine envisaged an "integrated and extended battlefield", where ground forces would collaborate in an integrated fashion

with the Air Force, employing all sorts of new weaponry and C³I systems as well as integrated “strike complexes”. Weapons systems and platforms such as J-STARS (Joint Surveillance and Target Acquisition Radar System) and the MLRS (Multiple Launch Rocket System) fitted well into this vision.

- ? Even more visionary was the forward planning, published (or rather: leaked) under the label “AirLand Battle 2000” (ALB 2000), which envisaged an even more extensive use of futuristic weaponry and C³I—as elements in overtly offensive operational plans.¹²⁵

Both ALB and ALB-2000 focused on the ground battle which made them rather controversial, especially in Germany. Constituting the most likely battleground neither the population nor politicians had any liking for war-fighting plans (especially as the option of nuclear escalation remained), but they much preferred deterrence.

What NATO (as opposed to the US Army) adopted was therefore a more moderate, and certainly more palatable version of deep strike, pertaining merely to the aerial domain. The new doctrine was initially known as the “Rogers Plan” after SACEUR Bernard Rogers who first referred to it. When adopted as official NATO guideline it was labelled the FOFA (follow-on forces attack) doctrine. It envisaged the interdiction, far behind FEBA (forward edge of the battle area) of the second and third Soviet echelon (i.e. their follow-on forces), by means of air and missiles strikes, including the aforementioned “strike complexes”, but without ground forces and certainly without manoeuvre warfare across Germany.¹²⁶

While all of the above were American initiatives for improved conventional NATO defences, the United States also such the collaboration (if only for the sake of burden-sharing) of the Alliance as such in its conventional force planning, e.g. in the frameworks of the “Emerging Technology (ET) Initiative”¹²⁷ and the “Conventional Force Improvement Initiative”¹²⁸—none of them, however, with particularly impressive results.

In the defensive “camp” were various advocates (including the present author) of non-offensive defence (NOD, also known as defensive or non-provocative defence). While not all NOD advocates emphasized technology, quite a few (but *not* the present author) certainly did, which may justify labelling them proponents of a theory of a “defensive RMA”.

Quite a few thus envisaged an extensive defensive use of ET,

especially PGMs (precision-guided munitions), mainly for anti-tank warfare,¹²⁹ but to some extent also for air or coastal defence. Presumably, the future would see an “automated battlefield” (as argued by former SIPRI director Frank Barnaby), and borders and territory could be defended by means of “impenetrable” stationary forward defences (envisaged by Norbert Hannig) or small infantry units operating in a network mode on their home territory, as suggested by Horst and Eckhardt Afheldt, among others—all without any recourse to nuclear weapons.¹³⁰

2.8 Lessons from the Past (?)

We have thus seen that the present RMA is not without precedents, but that history has known several RMAs as well as a couple of (more profound and far-reaching) military revolutions. In most cases, RMAs and MRs had something to do with technology, including military technologies but at least as decisively with civilian technologies impacting on the military domain. Just as important, however, were developments in other societal realms, e.g. the changing role of the State, the economy and sociological factors. The only real revolution where military technology seemed to play a decisive role was thus the nuclear revolution.

Another important lesson from the past seems to be that, paradoxically, revolutions have evolved gradually, often over spans of decades or even longer. Military innovations with any lasting impact have generally had less to do with the invention of new “gadgets” and much more with how these became embedded in new strategic, operational and tactical thinking, as well as in the institutions as such. As a general rule, this was more likely to happen after major wars.¹³¹

3 THE NEW RMA: BACKGROUND

The present RMA (if so it is) is very much an American phenomenon with only few reverberations elsewhere. Hence, it makes sense to look at some of the “constant” factors underlying U.S. military planning as well as to some of the defining experiences which have created them. Two wars stand out in this respect, namely the Vietnam War and the war against Iraq in 1991, of which a brief account will be provided.

3.1 The Vietnam War

Following the logic of containment and the belief in “falling dominos”,¹³² the United States arguably almost “stumbled” into the Vietnam War when the French colonial power withdrew from Indochina following its humiliating defeat at Dien Bien Phu.¹³³

The French forces had been just as unable to defeat the guerilla forces of the “Vietcong” as Napoleon had been in his war against their Spanish precursors (*vide supra*). The Vietcong (assisted by North Vietnam) waged a typical asymmetrical struggle (albeit occasionally also featuring regular warfare such as sieges and armoured offensives), as had been announced by Ho Chi Minh and orchestrated by General Vo Nguyen Giap. The latter described it in the following terms:

Our units operated in small pockets, with independent companies penetrating deeply into the enemy-controlled zone to launch guerilla warfare, establish bases, and protect local people's power. (...) We gradually formed a network of guerilla bases. (...) The fatherland was being freed inch by inch in the enemy's rear lines. There was no clearly defined front in this war. It was wherever the enemy was. The front was nowhere, it was everywhere. (...) The enemy wanted to concentrate their forces. We compelled them to disperse. By successively launching strong offensives on the points they had left relatively unprotected, we obliged them to scatter their troops all over the place in order to ward off our blows, and thus created favorable conditions for the attack at Dien Bien Phu.¹³⁴

The United States fared no better than the French, even though it had devoted considerable resources to devising effective strategies for “counter-insurgency warfare”.¹³⁵ First of all, realising the importance of separating the guerilla from the population, the USA and their South Vietnamese clients established fortified villages (“strategic hamlets”), but thereby restricted the movement of villagers more than that of the guerilla, thus allowing the Vietcong to pose as liberators. Moreover, the plan created *de facto* free-fire zones outside the hamlets, thereby contributing to rather indiscriminate warfare against civilians which also boosted the popularity of the guerillas.¹³⁶

Secondly, the Americans attempted to defeat the guerilla asymmetrically, by capitalising on their supremacy with regard to air power, which was expected to provide them with an edge in surveillance as well as efficient means of air-to-ground combat. The attempt was, however, thwarted by a terrain which increased the elusiveness of the guerillas who were, moreover, provided with quite

sophisticated air defence systems by the USSR. In order to surveil an area, aircraft had to use defoliants and other weapons causing severe, extensive and lasting environmental damage.¹³⁷ Moreover, the indisputable technological edge enjoyed by the United States was rendered irrelevant by the actual combat situations, as their supersonic aircraft practically never flew at supersonic speeds..¹³⁸

Thirdly, the Americans attempted to defeat the guerillas symmetrically by training and deploying special forces such as the Green Berets, by developing “search and destroy tactics” for the ordinary forces, etc. However, these tactics were rendered futile by the guerilla’s refusal to expose itself before having attained a crushing tactical superiority. Hence, the dispatched “search and destroy” units frequently found themselves entrapped and subsequently killed, and more than eighty percent of all fire-fights were initiated by the Vietcong.¹³⁹ Even worse, because of the (deliberate) intermingling of combatants with civilians, such missions often ended up targeting civilians rather than the elusive guerillas— with the My Lai massacre as the best known example.¹⁴⁰

Fourthly, the US arms industry developed of a panoply of advanced anti-personnel weapons, to be delivered from the air, by the land forces, and for installation in a booby-trap mode, including napalm, fragmentation weapons, small calibre/high velocity munitions, etc. However, while inflicting severe suffering on the civilian population, these weapons provided no solution to the problem of the target’s elusiveness.¹⁴¹

Fifthly, the Americans tried to defeat the guerilla through ordinary attrition, i.e. by steadily building up the pressure in terms of soldiers, but they failed to take into account the expansive character of the guerilla movement. Even though the US ended up with no less than 550,000 troops in Vietnam, they consistently found themselves outnumbered.¹⁴² Moreover, the resultant need for reinstating the draft and the heavy death toll of around 60,000 fatalities, took the political struggle back to the U.S. homeland, where the body bags were not appreciated, especially as no victorious end was in sight.

Finally, the USA sought victory through strategic bombing of North Vietnam. However, even though over eight million tons of explosives were dropped on Vietnam from 1965 to 1973 (as compared with the two million in all of WWII), the Vietnamese refused to surrender.¹⁴³ As argued by James William Gibson, throughout the war the United States had thus been the victim of the

false logic of “techno-war”:

For the military as well as civilian policy-makers, the enemy becomes a mirror image of ourselves, only “less” so. Military strategy becomes a one-factor question about technological forces; success or failure is measured quantitatively. Machine-system meets machine-system and the largest, fastest, most technologically advanced system will win. Any other outcome becomes unthinkable. Such is the logic of Technowar.¹⁴⁴

This logic was bound to produce fatal results, because it was oblivious to the fact that the enemy was of an entirely different “species” than the industrialized power, and that the supremacy of an industrialised country was largely irrelevant for a distant and unfamiliar battlefield. As later acknowledged by one of the main architects of the U.S. war in Vietnam, Secretary of Defense Robert MacNamara, the United States had seriously underestimated the resolve of the enemy as well as the fragility of the domestic consensus.¹⁴⁵ Neither Congress nor the general public were prepared to accept thousands of body-bags for what appeared to be a lost cause,¹⁴⁶ also because of the revelations by the media of several instances of very questionable practices, raising questions about the very legitimacy of the war.¹⁴⁷

The main legacy of Vietnam became a significant tempering of the US interventionist impulse, as evidenced by the “Vietnam Syndrome” and the “Nixon Doctrine”, according to which the United States would let others do the actual fighting, limiting its own role to general deterrence and the provision of support for regional allies.¹⁴⁸ Never again would a US president dispatch US troops to a regional conflict in which the United States had no vital stakes and where there would be a significant risks of casualties. To the extent that the United States should become involved it would have to develop virtually casualty-free forms of intervention.

The late 1970s and 1980s saw a few attempts at escaping the Vietnam Syndrome, most of them related to the Persian Gulf region, for which the Rapid Deployment Force was created, but none of them were particularly successful and a few (e.g. the Iran rescue attempt) ended up as humiliating failures.¹⁴⁹

3.2 The War against Iraq

With the end of the Cold War in 1989/1991, however, everything seemed to change. No longer was there any risk that a Third World

conflict might trigger world or nuclear war.¹⁵⁰ Hence there was no real need to collaborate with the former Soviet Union or Russia as its successor (or with anybody else, for that matter) on the management of crises around the world.

The world seemed to be unipolar and likely to remain so for a long time,¹⁵¹ giving the United States considerable latitude with regard to military intervention. However, the new situation not only removed reasons *not* to intervene (to avoid superpower crisis and ultimately world war) but also most reasons for the US to intervene (e.g. in order to block a Soviet advance) as large tracts of the world had simply lost their former importance. Hence the United States found itself in the role of the “reluctant sheriff” with the option of intervening, but no compelling reasons to do so¹⁵²—unless, of course, it were to make the promotion of democracy and human rights in distant countries a *casus belli* in its own right, without regard to US national interests.¹⁵³ Thanks to its unchallenged military preponderance, the USA also had the choice between intervening in a multilateral setting (e.g. the United Nations) or doing so unilaterally.¹⁵⁴ In the Iraqi case, they initially opted for the former.

Having previously supported Iraq (politically) during the latter’s 1980-1988 war against Iran (a former prominent US ally transformed into its main regional foe by the revolution)¹⁵⁵—and having not even sought to deter Iraq from attacking Kuwait¹⁵⁶—the 1990 attack provoked a fierce US response, albeit mainly undertaken under the auspices of the UN.

The military aspects of the operation were divided into two parts, i.e. the defence of Saudi Arabia against a feared follow-up Iraqi attack and the liberation of Kuwait, labelled “Desert Shield” and “Desert Storm”, respectively. To which extent the former was necessary is impossible to ascertain, but the deployment of US forces was also used as preparations for the attack against Iraq, which was an almost flawless success. Desert Storm was undertaken by means of initial cruise missile and air strikes against Iraqi air defence systems and command centres, followed by strikes against the Iraqi ground forces—all with astonishing success and virtually without US or allied casualties.¹⁵⁷

The war was seemingly also a “clean war” in several respects. Not only was it mandated by the United Nations (Security Council resolution 678) which ensured conformity with the *jus ad bellum* criterion, and the war was ended with the restoration of the *status quo ante bellum*, i.e. with the liberation of Kuwait. The war was

apparently also waged in conformity with the *jus in bello* requirements of discrimination, proportionality, non-combatant immunity, etc.—properly weighed against “military necessity”.¹⁵⁸ There has been some dispute over the number of Iraqi battle deaths (especially along the “Highway of Death”) as well as various claims to the effect that the US committed actual war crimes, but none that really stand up to closer scrutiny,¹⁵⁹ even though it must be acknowledged that all the facts are not available as the media coverage of the war was closely supervised by the military in order to prevent a repetition of the Vietnam debacle.¹⁶⁰

The war pointed forward towards future “virtuous wars” and “humanitarian interventions” by being discursively framed as a “battle between good and evil”,¹⁶¹ which made it easier to use it as a “template” for future wars and interventions. The victorious Gulf War thus became almost “paradigmatic” for subsequent US military planning. Not only was it allowed to become a yardstick for what would presumably be required for a “generic” major regional conflict (*vide infra*).¹⁶² It also formed the model for how to wage war “U.S. style”, *inter alia* because it was seen as confirming the thesis that a new RMA was in progress.

However, there has been a serious dispute over what was the decisive factor, i.e. whether air power alone would suffice for winning a war, or whether it was merely an indispensable prelude to land war.¹⁶³ More fundamentally, it has been questioned to which extent it makes sense at all to extrapolate from the war against Iraq to other wars, *inter alia* because the terrain was uniquely favourable to the allies, and because Saddam Hussein must have been either a strategic fool or prevented by other factors (e.g. his paranoid fear of his own military) from putting up a more potent defence. It has further been questioned whether the United States could have won if Iraq had already been successful in its quest for nuclear weapons¹⁶⁴—thus providing an additional argument for counter-proliferation (*vide infra*).

3.3 From Improvisation to Planning to Uncertainty

The United States has a long history of believing in revolutionary military change. Hence it would almost constitute a revolution if U.S. military planners were to believe in continuity and dismiss the idea of revolutionary change.

On the other hand, the USA also has an even longer history of

military improvisation.¹⁶⁵ For quite a long time, it thus acted in accordance with the Hamiltonian admonition that “Extensive military establishments cannot, in this position, be necessary to our security”.¹⁶⁶ Having neither any major standing armed forces nor any arms industry, the US thus “improvised” its conduct of WWI and subsequently demobilized most of its armed forces and converted most of its newly created arms industry¹⁶⁷—as it did in WWII, which was likewise followed by demobilization and conversion.¹⁶⁸

Only with the onset of the Cold War did the United States thus really realize the need for constant military preparedness, both in terms of allies, armed forces and an arms industry to supply them.¹⁶⁹ Henceforth, however, i.e. for the entire period from around 1946 to 1990, the USA remained at a permanent, albeit occasionally low-key, “war footing”, emphasizing the need for readiness, both in terms of standing armed forces, vigilant intelligence services,¹⁷⁰ and a military-industrial complex,¹⁷¹ including institutions tasked with military R&D and innovation—and reflected, among other things, in large peacetime military expenditures.¹⁷² All of this was, of course, facilitated (and the costs thereof easily justified) by the constant presence of a credible and formidable threat, personified by the Soviet Union.¹⁷³

Since the end of the Cold War, however, military planning has been significantly affected by the absence of a credible enemy, which has removed the foundations for previous planning. Either new enemies had to be found or ways had to be devised for how to plan without a stipulated adversary.¹⁷⁴ In either case, a more or less intact bureaucracy was tasked with the job, featuring three-and-a-half services (Army, Navy, Air Force and Marine Corps) with the Joint Chiefs of Staff (JCS) to coordinate, and the Secretary and Department of Defense (SoD and DoD) to oversee everything.¹⁷⁵ However, military planning has had to take novel, but increasingly salient factors into account:

First of all, a certain budgetary squeeze. Even though it left the United States with, by far, the world’s largest military budget, it nevertheless necessitated a reorientation.¹⁷⁶ Secondly, a seemingly growing aversion to running risks in terms of human lives—i.e. a distinct preference for what Edward Luttwak aptly labelled “post-heroic warfare” where the tolerance for own casualties was close to zero—at least in the minds of politicians.¹⁷⁷

Thirdly, the importance of what one might call the “humanitarian imperative” seemed to increase, at least in relative terms, as threats

to national security receded into the background. Not only did this spur the US to become militarily involved in both Somalia and the Balkans, albeit usually too late—and not at all in Rwanda, where it was most needed (*vide infra*). It also placed severe constraints on how armed force might be used. If military power was to be employed for the sake of human rights and/or to relieve human suffering, it had better be as discriminating and non-lethal as possible. Hence the quest for “non-lethal weapons”¹⁷⁸ and for minimizing collateral damage. At the very least no US President could afford to (be seen to) wage indiscriminate warfare with a large civilian death-toll—something which might also be ensured through control with the media coverage.¹⁷⁹

3.4 Military Planning in the Nineties

The period since 1990/91 (featuring not only the end of the Cold War but also the victorious Gulf War, *vide supra*) has seen three major planning reviews: The “bottom-up review” and the two successive “quadrennial defense reviews”.

3.4.1 The Bottom Up Review 1993

The end of the Cold War obviously necessitated a review of US defence planning. Realizing that in this endeavour the Clinton Administration was up against the powerful factor of bureaucratic inertia, a so-called “Bottom Up Review” (BUR) was launched. The proclaimed intention was (as had previously been suggested by independent analysts)¹⁸⁰ to undertake an unbiased assessment of military needs: What threats was the US likely to be up against; which military requirements did this entail; and what type of forces, in what numbers and deployed where, would be needed to meet these requirements?¹⁸¹

Eventually, however, the BUR came up with recommendations for slightly less of the same kind of military power as had previously been fielded against the USSR. A new threat was proclaimed to have emerged, namely that of “rogue states” (also called “backlash states” or, more diplomatically, “states of concern”, with Iran, Iraq, Libya and North Korea as the most obvious candidates).¹⁸² The planning guideline became a defence of the United States’ “interests” against a couple of such states simultaneously. Hence the need to be able to fight and win two “nearly simultaneous”

MRCs, i.e. major regional conflicts (sometimes labelled “contingencies” and later mainly known as “MTW”, i.e. major theatre wars).¹⁸³ In the most ambitious plans the aims were defined as “win-win”, implying that the US should go on the offensive in both theatres simultaneously, whereas more modest versions envisaged a defensive posture in one of the two theatres, i.e. a “win-hold” strategy. The planning assumption was that these MRCs would be fairly “standardized”, i.e. more or less like the hypothetical war against the USSR, only smaller, and pretty much like the 1991 Gulf War.

However, some thought was also given to “non-standard contingencies”, some of which were termed “low-intensity conflicts” (LIC) where US forces would be tasked with “operations other than war” (OOTW, sometimes labelled “military operations other than war”, i.e. MOOTW)¹⁸⁴ or even peacekeeping¹⁸⁵—but the debacle in Somalia (*vide infra*) militated strongly against becoming involved in such contingencies again.

Closely related to the rogue states theme was the renewed emphasis on ballistic missile defence as well as on non-proliferation and counter-proliferation, which had a dual focus. On the one hand, it focused on preventing rogues (especially Iraq, Iran and North Korea)¹⁸⁶ from acquiring weapons of mass destruction (WMD, including nuclear, chemical and biological weapons and often expanded to also include ballistic missiles).¹⁸⁷ On the other hand, it underlined the need to find means to defend the United States (and, to some extent, allies) against ballistic missile attacks, either by defensive means (i.e. ballistic missile defence, BMD) or offensively, i.e. by pre-emptive strikes.¹⁸⁸ The ambition was to

develop capabilities to locate and destroy WMD storage, production, and deployment facilities of potential aggressors and defend our forward-deployed forces from such weapons.

The BUR did not place much focus on particular technologies nor on the RMA, but it did recommend changes in the “setting” of military innovation and R&D (research and development), e.g. with the ambition to better exploit dual-use technologies:

Redirect resources to investments that improve both our defense posture and our competitive position economically. Facilitate reinvestment that allows defense industries to shift to non-defense production. Support the development of dual-use technologies and encourage the freer flow of technology between the military and civilian sectors.

It also pledged to

... maintain the technological superiority of our weapons and equipment in the world. Operation Desert Storm demonstrated that we produce the best weapons and military equipment in the world. This technological edge helps us to achieve victory more swiftly and with fewer casualties. We must design a balanced modernization program that safeguards this edge and the necessary supporting industrial base without buying more weapons than we need or can afford.

The intention was thus to develop more blueprints and prototypes of new weapons systems while postponing actual serial production and deployment until the actual need arose.¹⁸⁹

A number of “RMA themes” (*vide infra*) were also included in the BUR, e.g. the importance of Battlefield Surveillance; Command, Control, and Communications and on “advance munitions”:

(O)ur planning envisions the early deployment of reconnaissance and command and control aircraft and ground-based assets to enable our forces to see the enemy and to pass information quickly through all echelons of our forces. (...) Advanced systems—such as the Joint Surveillance and Target Attack Radar System (JSTARS), the upgraded Airborne Warning and Control system, (AWACS), and the Milstar satellite communications system—will ensure that U.S. forces have a decisive advantage in tactical intelligence and communications. (...) Precision-guided munitions (...) as well as new types of munitions still under development are needed to ensure that U.S. forces can operate successfully in future MRCs and other types of conflicts. New “smart” and “brilliant” munitions under development hold promise of dramatically improving the ability of U.S. air, ground, and maritime forces to destroy enemy armored vehicles, and halt invading ground forces, as well as destroy fixed targets at longer ranges, thus reducing exposure to enemy air defenses.

3.4.2 *The First Quadrennial Defence Review 1997*

In 1996, the US Congress mandated a new review and instituted quadrennial defence reviews, the first to be finalised in 1997.¹⁹⁰

Without significantly modifying either goals or strategy, the resultant report placed much greater emphasis on technology and *expressis verbis* referred to the RMA, by pledging to

1. Pursue a focused modernization effort in order to replace aging systems and incorporate cutting-edge technologies into the force to ensure continued U.S. military superiority over time;

2. Continue to exploit the “Revolution in Military Affairs” (RMA) in order to improve the U.S. military's ability to perform near-term missions and meet future challenges.
3. Exploit the “Revolution in Business Affairs” (RBA) to radically reengineer DoD infrastructure and support activities.

Building on previous planning documents the QDR emphasised that

Our joint forces can realize the potential of the RMA if we create and exploit information superiority to achieve full spectrum dominance through the synergy of four new operational concepts: dominant maneuver, precision engagement, focused logistics, and full-dimensional protection. Achieving this full spectrum dominance means continuing to build an integrated, complex set of systems, especially a common command, control, communications, computers, intelligence, surveillance, and reconnaissance (C⁴ISR) architecture to achieve dominant battlespace awareness.

The document also mentioned the need to ensure “superiority in space”, e.g. by developing “capabilities required to protect our systems and prevent hostile use of space by an adversary”. As means to ensure “information dominance”, the QDR focused on a “C⁴ISR Architecture for 2010 and Beyond” with five principal components:

1. A robust multi-sensor information grid providing dominant awareness of the battlespace to our commanders and forces;
2. Advanced battle-management capabilities that allow employment of our globally deployed forces faster and more flexibly than those of potential adversaries;
3. An information operations capability able to penetrate, manipulate, or deny an adversary's battlespace awareness or unimpeded use of his own forces;
4. A joint communications grid with adequate capacity, resilience, and network-management capabilities to support the above capabilities as well as the range of communications requirements among commanders and forces;
5. An information defense system to protect our globally distributed communications and processing network from interference or exploitation by an adversary.

In its turn, information superiority would allow the US military to “significantly increase the speed of command, enabling forward deployed and early-entry forces to take the initiative away from numerically superior enemy forces and set the conditions for early, favorable termination of the conflict”, and allow U.S. forces to “position and employ widely dispersed joint air, land, sea, and space

forces”.

As already decided and partly implemented (under the *Force XXI* and *Army after Next* programmes) land forces should generally be lighter,¹⁹¹ and air- and sealift capacities expanded to allow for a swift deployment, often in joint operations with other services and exploiting “netted firepower”. As a contribution to this, the US Navy had already begun to reorient itself from genuinely maritime operations such as sea command and SLOC (sea lines of communication) protection¹⁹² towards projection of force against land targets under the labels *From the Sea ...* and *Forward ... from the Sea*.¹⁹³

Generally both the BUR and the 1997 QDR also reduced the number of forward deployed troops (and associated bases) in favour of a “surge potential”, in recognition of the changed meaning of “readiness”. Rather than being fully prepared for particular contingencies, what mattered was to have the capacity to rapidly deploy forces for unanticipated missions.¹⁹⁴

3.4.3 *The Second Quadrennial Defence Review 2001*

The 2001 QDR was published shortly after the 11 September attack.¹⁹⁵ In the light thereof it made a point of “promoting the defense of the United States to the top priority”, establishing a “homeland security” office with the explicit intention of “Using 21st Century Technology to Defend the Homeland”.¹⁹⁶

It represented a major departure from previous military planning in explicitly abandoning threat-based planning in favour of “capabilities-based” planning, as had been advocated by, e.g., research teams at the Rand Corporation.¹⁹⁷ However, the multi-dimensional “war against terror” (*vide infra*) launched by President Bush, Jr. also pointed to new enemies or rather: to the former “rogues”, now proclaimed to constitute nothing less than an “axis of evil”.¹⁹⁸

The new administration was more inclined to pursue the BMD than its (rather lukewarm) predecessor, basing this emphasis on the 1998 *Rumsfeld Report* the threat assessments of which were considerably more “alarmist” than those previously published.¹⁹⁹ Hence the decision to move ahead with BMD regardless of the ABM Treaty, from which the US announced its withdrawal on the 13th of December 2001.²⁰⁰

While this announcements explicitly reaffirmed “our own commitment to reduce U.S. nuclear forces significantly”, the

subsequent *Nuclear Posture Review* seemed to point in a different direction. It followed the QDR logic of abandoning threat-based planning in favour of a “capabilities-based approach”, establishing a “new triad” consisting of (nuclear as well as non-nuclear) offensive strike systems, defences (both active and passive”) and “a revitalized defence infrastructure”, all “bound together by enhanced command and control and intelligence systems.”²⁰¹

Part of the capabilities required by the 2001 QDR will still be “RMA technology”, but the new plan is more aware than its predecessor of the

... danger that states hostile to the United States could significantly enhance their capabilities by integrating widely available off-the-shelf technologies into their weapon systems and armed forces.

The ambition is thus not merely to maintain supremacy, but nothing less than “dissuading future military competition”. Furthermore, the capabilities-based plan requires “building a portfolio of capabilities that is robust across the spectrum of possible force requirements, both functional and geographical”.

In the information field, the new QDR emphasises the potential of “emerging technologies”, in particular such as can “significantly increase U.S. advantage in intelligence collection, analysis, and security”. Among the most promising it mentioned:

- ? Low-observable technologies that may be applied to collection platforms;
- ? Nanotechnology that may result in miniature, mobile, autonomous sensors that could penetrate the secure and remote facilities of an adversary;
- ? Advanced parallel processing and quantum computing to provide real-time processes, decryption, translation, and transcription of communications;
- ? Biometrics for tracking adversaries and providing secure authentication of individuals seeking network or facility access; and
- ? Commercial imagery for remote sensing of the earth.

By the turn of the millennium, the United States thus seemed firmly committed to exploiting the RMA, which takes us, at long last, to an account of the present RMA itself.

4 RMA THEMES

A number of, closely interlinked and interlocking, themes can be

identified in the present RMA debate—most of them tantamount to assertions that something fundamentally new is happening in the realm of technology. In a certain sense there is nothing new about this claim, as the United States has always believed in the importance of technological proficiency. While the historical account above showed that technology has played a role in previous RMAs and MRs, it also showed that technology was never the decisive factor. This time, however, it may actually be so.

4.1 The Information Revolution

We are all (at least in the “First World”) acquainted with the basics of the technological revolution as far as it affects our everyday lives.

Among its most widespread products are the digital watch, the credit card, the cell-phone, satellite television, the personal computer, the worldwide web (the internet, known to everybody by its acronym www), but sophisticated gadgets such as GPS (Global Positioning System) devices are also finding their way into private boats and even cars. Among the consequences of this information revolution is the fact that the globe is rapidly shrinking in the sense that real-time communication is possible regardless of distances (and at very modest costs), i.e. that all are (potentially) connected continuously. It also entails the potential of “global transparency” in the sense that occurrences in the most distant corners of the globe cannot be kept secret for long, but can be broadcast to the rest of the world in real time. The resultant information-based globalisation may also lead to a cultural and ideological homogenisation of the world, as all become (more or less) infected by the values of “McWorld” as aptly labelled by one of its sternest critics.²⁰²

Most of the above technologies have military implications, i.e. they are dual-use, and some (like the internet or GPS) were even created for military purposes, but showed remarkable spin-off potential. Hence it should come as no surprise that the information revolution has also affected the military realm, where the RMA is almost tantamount to the advent of “information warfare”.²⁰³ There are more and less radical claims about the implications thereof for war.

4.2 Information as a Force Multiplier

The least radical version has it that the new information technologies

facilitate regular military operations by means of improved intelligence, target acquisition and communications, allowing for long-range precision strikes by means of high-technology sensors, computers and advanced platforms, including satellites. It thus basically views information technologies as “force multipliers”.

Accurate surveillance and target acquisition (e.g. by means of J-STARS) combined with stand-off precision weapons (e.g. cruise missiles) thus allow for more precise strikes at enemy forces, perhaps even without the physical movement of weapons platforms and without any use of ground forces. Hence the claim (which is integral to the RMA thesis, albeit of an older date) about the primacy of air (and, in the future, space) power over land and sea power, the stronger version of which holds that wars can be won exclusively by such means.²⁰⁴

If such “surgically precise” air strikes are indeed possible, this will presumably allow for a substantial reduction of collateral damage, and thus for waging “clean” wars in full conformity with “just war” criteria of discrimination and non-combatant immunity. Wars from the air also remove the cumbersome human factor, i.e. the well-documented aversion to killing one’s fellow human beings, be they soldiers or civilians—an aversion which seems to be inversely proportional with distance, i.e. higher at close range than if killing takes place out of sight (as from an aircraft).²⁰⁵ Even more importantly, it will minimize the risk of own casualties, perhaps even for applying a “zero casualties” criterion, as may indeed be a *conditio sine qua non* for waging wars for interests that are less than vital (*vide supra*).

There is, as such, nothing new about the emphasis on information and its siamese twin, dis-information, i.e. deception. Conceiving, as did Clausewitz, of war as contest of wills,²⁰⁶ this makes perfect sense, as battle is just one possible means to the end of breaking the opponent’s will to fight. Indeed, Sun Tzu already argued that “warfare is the way of deception”. Even if actual combat is unavoidable it makes a lot of sense to seek a favourable outcome by outsmarting the adversary. As claimed by Sun Tzu, “the highest realization of warfare is to attack the enemy’s plans”, e.g. by the use of spies:

The means by which enlightened rulers and sagacious generals moved and conquered others, that their achievements surpassed the masses, was advance knowledge (...) There is no area in which one does not employ spies. (...) Thus double agents can be obtained and employed, Through

knowledge gained from them, you can recruit both local and internal spies. Through knowledge gained from them, the expendable spy can spread his falsehood, can be used to misinform the enemy.²⁰⁷

In the same vein, Liddell Hart advocated making the enemy's communications the primary target:

To cut an army's lines of communication is to paralyse its physical organization. To close its line of retreat is to paralyse its moral organization. And to destroy its lines of intercommunication—by which orders and reports pass—is to paralyse its sensory organization, the essential connection between brain and body. (...) To paralyse the enemy's military nerve-system is a more economical form of operation than to pound his flesh.²⁰⁸

4.3 War in the “Information Dimension”

The more radical version of “information warfare theory” has it that a matter of moving war into an entirely new domain such as cyberspace.²⁰⁹ Presumably such information dominance will allow for new forms of “manoeuvre” and even more “indirect strategies” than were ever dreamt of by Liddell Hart and others—ideally without any battles.²¹⁰

The importance of geography and topography is allegedly receding to the point where the power that masters the RMA is capable of hitting virtually every target anywhere in the world. The importance of forward deployment, bases etc. is thus presumably bound to decline. It is even conceivable that physical manoeuvre (of weapons platforms) will become increasingly superfluous by virtue of stand-off weapons such as cruise missiles and, in the future, perhaps also weapons in orbit.

To what extent this is new is, however, debatable. Arguably, this “deterritorialisation” has been in progress for a very long time, warfare gradually moving from the “concrete” environments of the land to the more “abstract” domains of sea, air and space—in the future perhaps even cyberspace. To the extent that the RMA thus deterritorialises war, it thus continues a trend rather than representing a genuine departure from the past (see Table 6).

The ultimate battlefield, however, is the enemy's “will”. On the battlefield, i.e. in the tactical domain, this is a matter of breaking the morale of the opposing troops (as has always been the main function of artillery). At the strategic and, even more so, the grand strategic and political levels, where the “will” is embodied in the political leadership, it may be a matter of influencing the hearts and

minds of their constituents, i.e. the civilian population—as was the ambition of the early air power theorists (*vide supra*). While this might be done by means of an application of brute military force, there may be other means to the same ends, for instance from the tool-box of “psychological warfare”.²¹¹ Here as well, propaganda and misinformation may be equally valuable, even though the latter may be objectionable.

In any case, the media play a central role in such warfare by virtue of their powerful influence on the hearts and minds of their viewers. Hence the need to “stage manage” military operations in order to convey the right impression to viewers, both at home (where a war might be lost if the population turns against it, as happened in Vietnam) and abroad. If sufficiently effective such stage-managed wars may not actually have to be fought, as illustrated by the movie *Wag the Dog* where a US president has a movie director produce a completely fictitious war against Albania, all “fought” within a studio with hired actors.²¹² In the future this might become a real option.

Table 6: Military Domains	Land	High Seas	Airspace	Space	Cyberspace
Character	Concrete, varied	Abstract, varied	Abstract, uniform	Abstract, Uniform	Non-spatial Uniform
Population	Inhabited	Uninhabited	Uninhabited	Uninhabited	n.a.
Legal status	Highly regulated	UNCLOS	Limited regulation	Very limited regulation	No regulation
Military use	Battleground Stationing area Supply routes	Battleground SLOCs	Battleground	Communications Potential Battleground	Communications Potential battleground
Weapons platforms	MBT, APC, Artillery, etc.	Warships Submarines	Aircraft Helicopters Airships Missiles	Rockets Satellites	Computers
Typical weapons	Guns, mortars, missiles, small arms	Guns, torpedoes, mines	Missiles, bombs, guns	Anti-sattelite weapons (laser guns)	Computer vira
Form of combat	Positional or manoeuvre warfare	Manoeuvre warfare	Manoeuvre warfare	Manoeuvre warfare	“Manoeuvre warfare”
Warriors	Regular soldiers Guerillas	Marines (Pirates)	Pilots, gunners, bombers	Astronauts ?	Computer wizards Information officers Hackers

While information warfare thus opens up new opportunities for the dominant power, it also creates new (mainly societal) vulnerabilities, as both terrorists, guerillas and organised crime are equally able to exploit the new opportunities.²¹³ This is one of the rationales for a reorganisation of the military, i.e. for an abandonment of the hierarchical structure which presents vulnerabilities in favour of a more robust network structure.²¹⁴

4.4 Principles of War of the Information Age

In a thought-provoking work on *The Principles of War for the Information Age*, written in 1998 as a textbook for the training of U.S. Army officers, Lt-Col. Robert R. Leonhard made a strong case for a thorough revision of the Principles of War (PW, *vide supra*) in the light of the “information revolution”. His main argument was that most of the PW were actually based on the assumption of uncertainty and unpredictability, i.e. what Clausewitz had called “the fog of war”.²¹⁵

Presumably the information revolution will remove this “fog”, necessitating a complete revision of the PW:

When technology hands us a clear picture of battlefield truth, it strikes at the heart of our doctrine organization, and tactical concepts. Our battlefield formations, planning procedures, and tempo are founded upon ignorance of the battlefield, which heretofore has been fundamental to warfare.²¹⁶

The following are the main points in the suggested revision:

- ? **“Manoeuvre”** has to be acknowledged as a means rather than an end, i.e. that of gaining an advantage over the enemy through “dislocation” which renders his strength irrelevant. Moreover, for this purpose the movement of forces into position has become largely obsolete, as the enemy can be dislocated by other means, either positionally, functionally, temporally or morally. The key to this is, according to Leonhard, combined-arms warfare.
- ? **“Offensive”** has never been a valid PW, as offence and defence always have to be combined. As a principle, it should thus be replaced by “opportunity”, defined as freedom to act.
- ? **“Mass”** has, likewise, never been a valid PW, and physical massing of troops has long been undesirable. Indeed, as Trevor Dupuy has shown, the battlefield is becoming increasingly empty,

as forces have to disperse in order to avoid destruction.²¹⁷ According to Leonard, the initial rationale for massing was to amplify killing power, which was due mainly to the inaccuracy of weapons. With precision weapons the celebrated Lanchester “linear” and “square laws” are no longer valid according to which an attacker needed two or four times the strength of a defender in direct and indirect fire engagements, respectively.²¹⁸ The other rationale for massing would be to achieve a shock effect, but this would mainly depend on the rapidity of the operation—and there is an inevitable trade-off between mass and mobility.

- ? **“Economy of Force”** presumably remains a valid PW in the information age, indeed should be elevated to meta-principle i.e. a “law of warfare”. Because “ignorance breeds miscalculation, which in turn leads to waste”,²¹⁹ the information revolution holds out the promise of unprecedented economy of force.
- ? **“Objective”**, e.g. as formulated in the “Weinberger Doctrine” is, according to the Leonhard, simply a safeguard on the part of the military against “excessive” civilian interference in the conduct of war. As it promises real-time communication and a perfect and simultaneous view of the battlefields of all theatres, the information revolution allows the civilian leadership to control combat continuously. Hence there is no need to avoid “mission creep”, but the military should willingly accept that the evolving combat may provide their political superiors with new opportunities to exploit.
- ? **“Security”** presumably remains valid, but should be specified as security against the known enemy rather than against uncertainty.
- ? **“Simplicity”**, on the other hand, has lost all validity because of the enormous data processing capacity of computers, which also removes the rationale for decentralisation.
- ? **“Surprise”** remains valid, but in an odd, topsy-turvy kind of way. No longer is it a matter of seizing the initiative, but rather of detecting enemy initiatives and swiftly adapting to them, as perfect information presumably makes possible.
- ? **“Unity of Command”** should be implemented through a “flattening of the hierarchy”, i.e. by removing all superfluous levels between the supreme command and unit commanders, as real-time communication would allow for.

While the above analysis is eminently logical, its very premise

seems questionable, i.e. the claim that information will produce “certainty”—which is not so much a technical as a psychological (or even philosophical) question. The “truth” on which col. Leonhard bases his analysis is not merely a matter of receiving the right information as of accepting it as true and trusting sufficiently in this to dare take chances.²²⁰ What speaks against his optimism is the act that most “surprise attacks” have been preceded by ample warning signs and even by what was in retrospect (with “20/20 hindsight”) recognised as conclusive evidence.²²¹

5 RMA AND U.S. CAMPAIGNS SINCE 1991

Since the 1991 Gulf War which set the stage for, and defined the parameters of, the RMA, U.S. military power has been tested in a number of interventions: In Somalia, in the Balkans (mainly in the Bosnia and Kosovo crises), in the ongoing confrontation with Iraq and, most recently, in the war against the Al Qaeda network and the Taliban in Afghanistan. These campaigns should be able to tell us something on the veracity of the RMA claims.

5.1 Somalia 1992-93

The U.S. intervention in Somalia is universally regarded as a complete failure. It was launched in the aftermath of the victorious Gulf War. As it is hard to find any possible strategic or economic motives for the intervention (except perhaps that of setting an example for others) it should probably count as a humanitarian intervention, here defined as an intervention undertaken on humanitarian grounds, regardless of the actual consequences.

The background was an almost total collapse of the Somali state after the overthrow of the dictatorial Siad Barre regime. No viable successor emerged and the country regressed into an antediluvian struggle between opposing clans and warlords—with catastrophic consequences for the civilian population. Almost by coincidence, this spectacle of human misery was broadcast worldwide by the CNN and others.

The US launched “Operation Restore Hope” in 1992/93, beginning with in a very stage-managed landing operations in the presence of all the media, but the operation soon went sour, as the U.S. abandoned any semblance of impartiality and transformed the peace-making operation into a campaign to get one of the local

warlords, Aydeed. It ended soon after the death of eighteen U.S. Rangers (special forces) and the dragging of one of the corpses after a jeep through the streets of Mogadishu.²²²

The only semblance between the entire operation and RMA-type operations was the deliberate use of the media. Neither did the US rely on airpower (but actually deployed ground troops), nor did its information technology really play any significant role. However, this seemed to place question-marks around the relevance of the RMA to at least certain categories of military operations (*vide infra*).

The United States apparently also drew a number of conclusions from its ill-fated humanitarian intervention, e.g. to avoid placing its forces in harms way, i.e. on the ground. Hence, the Clinton administration went out of its way to turn a blind eye to the even worse situation in Rwanda in the spring of 1994, where around 800,000 Tutsi and moderate Hutu were massacred by extremist Hutu in the course of a couple of months—and where an international military presence of as few as 2,500 troops could probably have prevented the genocide.²²³

5.2 Bosnia and Kosovo

The United States seems to have drawn two main conclusions from the combined lessons of the Somali and Rwandan failures, i.e. that something should be done to prevent genocide, but that interventions would have to be risk-free, i.e. without ground troops.

The need to do something soon arose as a consequence of the progressive break-up of Yugoslavia with the emergence of nationalistic dictatorships such as that of Milosevic in Serbia.²²⁴ Neither the European Union nor NATO or the United States were able to formulate coherent policies for how to deal with the problem until a couple of years into the conflict—an inability which was, at most, slightly related to any lack of military means.²²⁵

The first act of the story of the US intervention in the Balkans was the civil war in Bosnia between Serbs, Croats and Muslims, featuring the establishment of UN-protected “safe havens” and the genocidal Serb massacre of Muslims in Srebrenicka. Having for a long time refused to become involved the United States gradually pressured its NATO allies to accept its “Lift and Strike” policy of lifting the arms embargo on all sides to the conflict to allow for support of the disadvantaged side, and of launching air strikes at the Serbs. Eventually a breakthrough was achieved at Dayton on a

peace accord, effectively dividing Bosnia between the three main parties, but within the framework of a confederate scheme and underpinned by an international political and military presence.²²⁶

It would be hard to argue that the U.S. intervention in Bosnia vindicated the RMA claims. First of all, one of the reasons why the Europeans were initially unhappy with the air strikes advocated by the USA was that they actually had forces deployed on the ground who might be endangered by US air strikes, whereas the U.S. had refused to provide ground troops. Secondly, the blatant failures with the “safe havens” were not only (but certainly in part) due to misjudgements and incompetence on the part of the United Nations, but also to a lack of means—for which the United States carried a large share of the responsibility, making its allegation of UN impotence largely self-fulfilling.

Thirdly, that the peace accord was signed *after* the air strikes does not mean that it was signed *because of* them (a classic instance of the classical *post hoc ergo propter hoc* logical fallacy).²²⁷ The deal which the Serbs finally signed had not been proposed to them before, and they had actually previously accepted the territorial aspects thereof (almost identical to those of the “Vance-Owen Plan”), whereas these had been rejected by the other sides as well as by the USA). Finally, the air strikes launched against Serb positions were hardly RMA-style precision attacks, but rather traditional “Vietnam War-style” air strikes.

The second act of the drama was the Kosovo conflict. Having largely ignored the conflict for years (or even decades), after the Bosnia debacle the West in 1998 turned its attention to this Serbian province.²²⁸ Part of the explanation was probably that the western powers were aware of the fearful costs of having reacted too late in Bosnia, whence their eagerness to avoid repeating this mistake. Moreover they (and especially the United States) had reached the conclusion that military force was the only effective means of compelling Serb leader Milosevic.

Initially, NATO attempted “compellence” through quite unequivocal threats of military attack, combined with a (more or less sincere) attempt at reaching a negotiated solution at the Rambouillet talks.²²⁹ As this failed to produce the sought-for result, NATO on the 24 March 1999 launched an air campaign against the FRY (Federal Republic of Yugoslavia). The political ends of this campaign were not entirely clear (or rather: were revised several times during the campaign) but the choice of means was all the more unambiguous.

From the very beginning of the campaign, U.S. president Clinton made it absolutely clear that there would be no deployment of ground forces, i.e. that the campaign would be launched exclusively from the air.

The initial strikes were launched by means of cruise missiles and radar-seeking missiles directed against the air defence and command system of the Serbian forces—in perfect conformity with the RMA philosophy, as were the attacks against the Serb “infrastructure” (very permissively defined). In the later stages of the war some effort was devoted to actual strikes against the Serb forces in Kosovo, but without any impressive effect (perhaps the destruction of as few as thirteen Serb tanks). The reason was that the air campaign was waged on the basis of a “zero casualties” criterion, which dictated particular flight patterns such as bombing raids from high altitudes (i.e. out of range of Serb ground-based air defence) by means of B-52 bombers, rather than A-10 ground attack aircraft or helicopters which could have effectively engaged enemy forces and thereby protected civilians, but which would be “in harms way”.

Table 7: The Ethics of Flight Patterns	Flying altitude		
	3,000 m. (B-52)	300 m. (A-10)	30 m. (helicopter)
Opportunities for/ Risks of:			
Military hits/Protection of civilians	Low	Medium/High	High
Collateral civilian deaths	High	Medium/Low	Low
Own casualties	Very low	Medium	High

Not only did this reduce the military effectiveness of the campaign. It also raised questions about the credibility of NATO’s claims to be waging a “just war”, observing both *jus ad bellum* and *jus in bello* constraints (see Table 7). Similar questions were raised by the widespread use of cluster bombs and depleted uranium munitions, causing extensive and lasting collateral (including environmental) damage.²³⁰

The war was clearly an “RMA war” (also by virtue of the deliberate use of the media),²³¹ but its results did not unambiguously vindicate the claims of RMA advocates. Eventually, of course, the Serbian leadership caved, but the reasons are less clear than

sometimes assumed. Alternative explanations might be the Russian abandonment of their support for the FRY or the eventual (almost unequivocal) NATO threat of nevertheless deploying ground troops²³²—and, not least, that the compromise eventually agreed to by the Serbs was not at all what NATO had insisted upon at Rambouillet.

5.3 Iraq 1998

The “RMA strategy” selected for the Kosovo campaign seemed rather surprising in view of the unsuccessful use of the very same strategy against Iraq a mere couple of months before, i.e. in “Operation Desert Fox” of December 1998.

The 1991 Gulf War had been followed by attempts at disarming Iraq (under UN Security Council resolution 687), particularly with regard to weapons of mass destruction and ballistic missiles, and at adequately monitoring this disarmament.²³³ One means to enforce this was a set of rigid economic sanctions,²³⁴ but Iraq was also subjected to air strikes in 1993 and 1996. While one rationale thereof was enforcement of the disarmament regime, some of these attacks (none of which were authorised by the United Nations) were also intended to safeguard the “safe havens” which had been created for Iraqi Kurds and Shi’ites by the United States and its allies in 1991 and henceforth protected by so-called “No-Fly-Zones”, being patrolled by US, British and, until 1996, French aircraft (without UN authorisation).

When Iraqi compliance with UNSCR 687—measured against the increasingly rigid U.S. demands—by 1998 came to be seen as completely unsatisfactory, the United States began to issue threats of a major unilateral use of force (or in the framework of a “coalition of the willing”, i.e. effectively a “posse”), the absence of a UN mandate notwithstanding. The stand-off was finally broken by the USA with the launch of a four-day air campaign against Iraqi targets.²³⁵

“Desert Fox” was an unambiguous instance of an RMA campaign, undertaken exclusively by means of missiles and aircraft and meticulously stage-managed. Indeed, the suspicion arose that it had mainly been launched (or at least timed) with a view to preempting an impeachment of President Clinton over the Monica Levinsky scandal. Be that as it may, the campaign was completely ineffective in terms of ensuring Iraqi compliance with the verification

provisions of UNSCR 687. Rather it led to a complete termination of UNSCOM inspections, with the result that there have been no monitoring of any potential Iraqi rearmament attempts since December 1998. Nor was Saddam Hussein's rule over Iraq visibly weakened.

5.4 The War against the Taleban

By the time of writing (May 2002) the United States remained at war in Afghanistan as part of the "war on terrorism" (*vide infra*).

The background is, of course, the US involvement in supporting (both directly and through the Pakistani intelligence service ISI) the Afghani *Mujahidin* in their guerilla war of liberation against the Soviet Union from 1979 to 1989. Upon the Soviet withdrawal the rival Mujahidin factions (i.e. mainly the present "Northern Alliance") waged a ferocious civil war against each other for control of the country—and, not least, for control of the lucrative opium production and trade—leaving Afghanistan as a "failed state".²³⁶

Around 1994 a new force appeared, consisting mainly of war orphans educated in the *madrassas* (Koran schools) in Pakistan—the Taleban, which managed to establish control of the country around 1996.²³⁷ Not only did the Taleban enforce an extreme version of the (already extreme) *Wahabbi* form of Islam (invented by "mullah" Omar). They also forged ties with Osama bin Laden, who had previously been involved in the Afghani struggles, e.g. by recruiting Arab mercenaries to help the *Mujahidin*, and who had subsequently formed a terrorist organisation, *al-Qaeda* (the Base).²³⁸ The Taleban regime provided a safe haven for bin Laden and his "troops", allowing him to establish training camps—apparently both out of ideological sympathy and for money.

Apparently, the al-Qaeda was responsible for, *inter alia*, the (only partly successful) bomb attack against the World Trade Centre in 1993 as well as for the 1998 bomb attacks against the U.S. embassies in Nairobi and Dar es Salaam. The United States responded to the latter with cruise missile strikes against a chemical or pharmaceutical plant in Sudan (allegedly used for the production of VX chemical weapons)²³⁹ and an al-Qaeda training camp in Afghanistan which had been vacated prior to the strike.

When bin Laden was found ("beyond any reasonable doubt") to be responsible for history's most destructive terrorist attack,

against the World Trade Center and the Pentagon on the 11th of September 2001 (with a total death toll of around 3,500) the United States proclaimed a “war on terrorism”. The primary military components therein was “Operation Enduring Freedom”, i.e. a war against the al-Qaeda and the Taleban as their hosts. Even though the official U.S. discourse was not entirely consistent in the labelling of this war—alternatively referring to it as self-defence and as retaliation or punishment, it was certainly possible to justify it as a war of self-defence and thus as a just war, which was not only legitimate, but also legal as it was endorsed by the UN Security Council in its resolutions 1368 and 1373, both of which explicitly referred to the right of self-defence.²⁴⁰

The war was partly waged in conformity with the RMA philosophy. It was initiated with cruise missile strikes against air defence and C³I installations, followed by air strikes against selected military targets. The main problem in this respect was, however, an absence of worth-while targets, in its turn a result of the devastation caused by more than two decades of war. Moreover, the Taleban at a early stage adopted a guerilla posture with a deliberate dispersal of its forces, which made the use of ground troops indispensable. Most of these were indigenous, i.e. an *ad hoc* coalition of formerly warring factions under rival warlords, mainly from the northern (and non-Pashtun) parts of the country—hence the term “The Northern Alliance”. While these forces did most of the actual fighting, the United States also deployed ground forces, mainly special forces such as the Delta Force and the Rangers—primarily as backup of the indigenous forces, but also seeing some actual combat.

The campaign was arguably remarkably successful, as it succeeded in conquering Kabul, thereby overthrowing the Taleban regime—followed by “mob-up operations” which were still in progress by the time of writing. On the other hand, the campaign failed (as probably any military campaign would have) in achieving the main goals that were formulated by its inception, i.e. to capture Osama bin Laden and/or mullah Omar. The failure to capture the former in the battle at Tora Bora was apparently due to the failure to deploy US ground troops.²⁴¹

It is also unknown to which extent the air operation succeeded in waging a “clean war” without excessive collateral damage. Some of the ordnance used (e.g. cluster bombs and gargantuan “Daisy Cutters”) was surely unlikely to be very discriminatory—but the very effective U.S. control of the media coverage succeeded in

preventing much incontrovertible evidence of civilian casualties. Perhaps we shall never know just how many Afghanis were killed.²⁴²

6 MILITARY CHALLENGES OF THE FUTURE

The Afghan war illustrates some of the challenges which the United States (and, to some extent, other states) is likely to confront in the years to come—and against which the RMA will have to be measured in order to be of lasting importance.

6.1 Traditional Wars

RMA-type armed forces are most obviously relevant for traditional wars between states of more or less the same type. However, it is not easy to come up with scenarios for any traditional wars between states, and even harder to point to any in which the United States would conceivably become involved. The following four scenarios appear to be the least unlikely.

1. A war between China and Taiwan, e.g. in response to a declaration of independence by the latter. While this is certainly conceivable, it is not, in the present author's assessment, likely. Moreover, it strains the imagination to envision the United States coming to the rescue of Taiwan (regardless of the Taiwan Relations Act), if only because of China's possession of nuclear weapons. At most, the United States would probably seek to deter a Chinese attack, e.g. by means of naval "posturing" as it did during the 1996 crisis.²⁴³
2. A new war in the Middle East, perhaps between Israel and Syria over the Golan Heights, conceivably even with the participation of Egypt on the side of Syria.²⁴⁴ While the United States would undoubtedly support Israel, e.g. by means of arms deliveries (including RMA weaponry), some missile defence protection and perhaps intelligence, neither would Israel need more direct U.S. support, nor would the USA be eager to involve itself directly, if only because this would probably cost it its alliance with Saudi Arabia and other economically important Arab states.
3. A new Korean war, perhaps launched by the North in order to forestall complete (economic, social and political) collapse. While this is not at all likely, it is probably less unlikely than the above, and the United States would be treaty-bound to become involved

on the side of South Korea. However, unless the North had succeeded in crossing the nuclear threshold prior to launching the war, the South would not really need any major assistance—and if the North had gone nuclear it strains the imagination to conceive of the USA going to war for the sake of South Korea.²⁴⁵

4. A new war against Iraq, e.g. launched by the USA with the overt goal of deposing Saddam Hussein, which was being openly threatened at the time of writing, couched in terms of continuing the “war against terror.”²⁴⁶ If launched (e.g. in the spring of 2003) such a war would probably take the form of an “RMA war”, but its outcome is unpredictable.

The RMA would thus, at most, be relevant for a war which would probably be unwise to launch in the first place—if only because an unprovoked attack against Iraq would almost certainly spoil any changes for preserving the US alliance with the other Gulf states, prevent the US from playing any leading role in a renewed Middle Eastern peace process—and perhaps create new terrorists.

6.2 “Uncivil Wars” and Peace Support Operations

Much more likely than traditional wars are such “uncivil wars”²⁴⁷ as typically afflict weak or failed states, such as Afghanistan from 1989 to 1996 or African states such as Somalia, Rwanda, Liberia, Sierra Leone, Angola or the DR Congo.²⁴⁸

In such contingencies, the main need will be for peacekeeping and peace-enforcing forces tasked with enforcing and maintaining a truce between the warring parties. As the latter are almost always very primitively armed (the AK-47 “Kalashnikov” being their typical weapon) the peace supporting forces will not need any technological sophistication as that promised by the RMA. Rather, the need will be for infantry and special forces as well as for armoured personnel carriers and helicopters. As whatever truce may have been negotiated will usually be fragile, however, the foreign troops will have to be prepared for “mission creep” in case fighting erupts anew. This will inevitably entail risks, and to deploy with a “zero casualties” rule will be inconceivable.

It seems entirely conceivable that the United States will want to stay out of such contingencies, but it will then have to face the risk of progressive irrelevance—and for a power with the self-image of a “benevolent hegemon” it may be hard to justify letting others (e.g.

the Europeans) shoulder the main burden of ensuring global peace.

6.3 Homeland Defence and the War against Terrorism

What may prepare the United States for “asymmetrical conflicts” such as the above may be the present “war against terrorism”, if only because this is just as asymmetrical a struggle as that found in failed states in the Third World.²⁴⁹

Terrorist groups come in many shapes and sizes.²⁵⁰ Previous terrorists (mostly left wing or nationalist, but certainly political) arguably tended to use terror as a means of communicative action, and therefore tended to keep the death toll limited.²⁵¹ However, new forms of terrorism have been spurred by religious motives (Islamic, Jewish, Christian, Buddhist or Hindu), and terrorists have tended to view their struggle as total and “cosmic”. Hence they have been prepared to shed all inhibitions with regard to casualties²⁵² and shown an interest in acquiring WMDs such as chemical and biological weapons.²⁵³

However, the 11 September attack showed that a society such as the USA is also vulnerable to other forms of terrorist attacks, which may have mass destructive effects without any use of WMD.²⁵⁴ One might also think of attacks against installations such as major chemical plants or nuclear power plants and storage sites.²⁵⁵ Much speculation has, likewise, gone into the danger of “cyber-terrorism”,²⁵⁶ for the conduct of which organisations such as al-Qaeda seem well suited by virtue of their networked organisation.²⁵⁷

The U.S. response to the 11 September attack has been multi-dimensional. Besides the above campaign in Afghanistan, it has included both international diplomatic and legal initiatives,²⁵⁸ but it has also produced a new emphasis on the direct defence of the U.S. homeland, as evidenced by the establishment of an Office of Homeland Defense, the effects of which were impossible to assess by the time of writing.²⁵⁹ While it is certainly possible to envision improvements in airport security, intelligence gathering and similar defensive measures, including the skilful use of information technologies for these purposes,²⁶⁰ it is difficult to point to military means of protecting the U.S. homeland against terrorist attacks—much less any that would call for RMA-type military means.²⁶¹

7 CONCLUSION

We have thus seen that the promises of the Revolution in Military Affairs are much more questionable than often assumed. First of all, while the past has indeed seen both RMAs and military revolutions, none of these have been driven primarily by technology—with the partial exception of the nuclear revolution. Secondly, the alleged breakthrough for the new RMA, i.e. the Gulf War, was unique in too many respects to serve as a model for future military campaign. Thirdly, the subsequent attempts at exploiting the RMA in the Balkans, against Iraq and most recently in Afghanistan have not been particularly convincing. Finally, the RMA would be obviously irrelevant for most of the likely military challenges for the future.

8 ENDNOTES

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⁴ Lider, Julian: "Die sowjetische Militärwissenschaft. Beschreibung und kritische Bestandaufnahme", *Öster-reichische Militärische Zeitschrift*, vol. 21, no. 2 (1983), pp. 143-153; Savkin, V.Ye.: *The Basic Principles of Operational Art and Tactics. (A Soviet View)* (Moscow, translated and published by the U.S. Air Force, Washington DC: U.S. Government Printing Office, 1972); Arbatov, Alexei: "Military Doctrines", in IMEMO (eds.): *Disarmament and Security. 1987 Yearbook* (Moscow: Novosti, 1988), pp. 201-224; Glantz, David M.: *The Military Strategy of the Soviet Union. A History* (London: Frank Cass, 1992), pp. 1-4; idem: "Military Strategy: Soviet Military Art: Challenges and Change in the 1990s", *The Journal of Soviet Military Studies*, vol. 4, no. 4 (December 1991), pp. 547-593.

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dominating set of capabilities in an area of military operations. *Dimension of warfare*. The dimension on which warfare is conducted, *Paradigm shift*. A profound change in the fundamental model underlying a segment of military operations.

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