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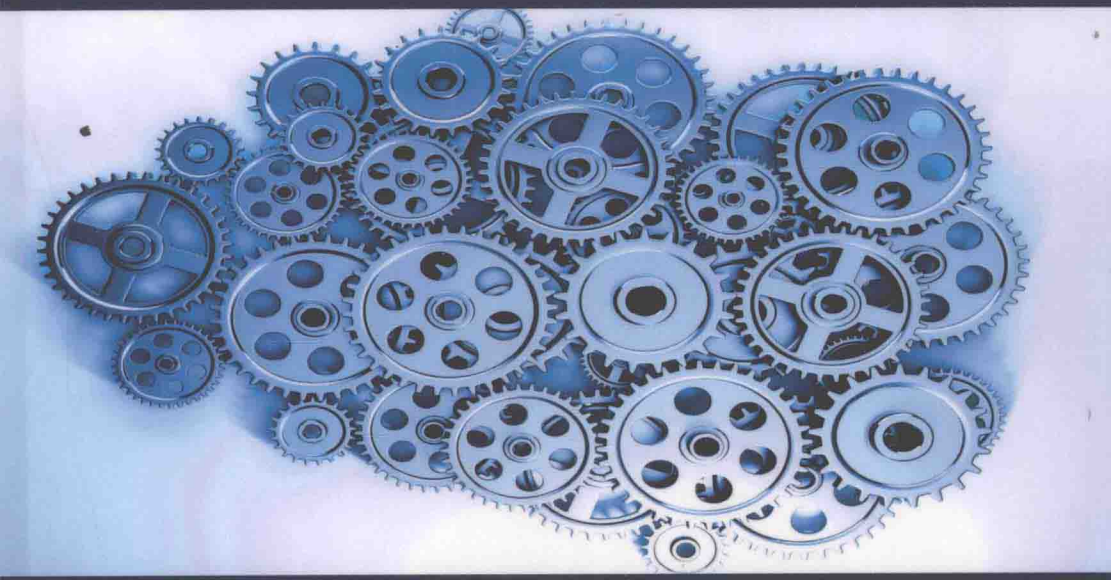

Volume 1

The Art of War in the Network Age

Back to the Future

Joseph Henrotin

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Intellectual Technologies Set

coordinated by
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Introduction

> Since no plan survives actual combat, and the art of forecasting is imperfect, efforts to predict with certainty the future of today's revolution in military affairs (RMA) must inevitably fail.
>
> Stephen J. Blank[1]

Military systems naturally reflect social, cultural and technical evolutions. In light of this, the study of strategic literature in recent years shows that much attention has been given to the evolutions implied by the implementation of computer networks, not only from a technical but also, and mostly, from a strategic viewpoint. The application of the Revolution in Military Affairs (RMA), which appeared in 1992, and then of the *Transformation*[2], 10 years later, are tightly linked to the spread of information technologies, but also to the actions and practices they imply [GOL 05]. Yet, if the art of war theory still represents "the art of dialectics of opposing wills using force in the resolution of conflict"[3], it also seems to represent the poor relation of technological developments. This is partly caused by its likelihood to become a real techno-military ideology, profoundly defined by technology [HEN 13b]. RMA and *Transformation* are both driven by strategic cultures full of techniques. Involvements in Afghanistan (2001–2014) and Iraq (2003–2008) seem to have overshadowed RMA and *Transformation*, the rational aspects of which seemed too remote

1 [BLA 97b, p. 61].

2 This word appears in italics given its politico-military use.

3 [BEA 85, p. 16].

from the imperatives of the counter-irregular struggle. This led Desportes [DES 06] to state that "transformation as the only way of evolution is now dead"[4].

These figures have shaped the practices and understanding of strategic actors and thus prepared their return at the heart of strategic debates. Works on the *AirSea Battle*, *Anti-Access/Area Denial* (A2/AD) and those focusing on regular operations in general now see a resurgence of themes linked to "technological war" and, along with it, to networks. However, quoting the debate of the 1990s, it is also about the "RMA after-next" implementation throughout technical artefacts – robots and autonomous weapons systems, nanotechnologies, networks, precision weapons, "augmented" soldiers or tandem "aviation, special forces". In certain aspects, if we considered the debate on RMA as being a historical episode, a "moment of technological optimism" in the evolution of the understanding of Americans and Europeans, the exact opposite could appear to be true. From this viewpoint, we have not yet given much thought to the strategic consequences of RMA's permanency – or of its resilience to the reality of conflicts. For the strategist, the risk is that RMA, among other issues, turns strategy into "tactics" – reducing strategy to pure technical execution, and taking away any political aspect it might hold. This would force us to reconsider the structuring between effectiveness and efficiency, with the risk of leading to "new old-regime armies", very advanced in terms of techniques, but inept in terms of strategy.

In the area of the conduct of warfare – so no longer on a theoretical level – these evolutions could suggest a "revolution", meaning an abrupt occurrence followed by a paradigm shift. This would represent a new phase in the historical evolution of the *character* of war and the way it is waged – considering that for many authors from the 1990s to today, it represented a change in *nature*. This statement is highly questionable since it is not so much a matter of a breakdown in the very notion of opposing wills than in the way this concept will be carried out. In reality, the disruptive character of evolutions since the 1990s can be debated from factual as well as conceptual viewpoints. It has already been the subject of many publications, which have somehow been forgotten:

– first, through the recurrence of the figure of the RMA as a *revolution* in the debate of the past few years, when dealing with the transformation of the

4 [DES 06, p. 39].

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debate taking place in military history around the military revolution of the 15th and 17th Centuries. This debate showed that if the concept can be expressed as a hypothesis and be thoroughly discussed, the conditions of achievement of this "revolution" are as specific as they are broad, and affect society as a whole;

– second, a study of the works carried out during the 1950s and the 1960s on technologies likely to be used in future conflicts shows that many contemporary artefacts come from there, such as for example the rationality of their use. This is particularly true for the network figure, whether it be in aviation (with the SAGE detection and tracking system, see *infra*) or in the naval sphere, with the appearance of data links, or also in the implementation of data centralization artefacts such as the "central operation" of ships under its modern form, as imagined by Admiral J.C. Wylie [WYL 14]. These evolutions show a willingness towards centralization coming from diverse sensors not only as means of representation of reality, but also as an attempt to master and reduce uncertainty. In this way, there is a *strategic desire*, which cannot be entirely fulfilled but through constant reification;

– finally, we can make the assertion that this strategic desire has been recurrent since the Cold War and, even more peculiarly, since the Vietnam War. This war triggered the process of RMA/*Transformation*, partly because it confronted rationalities linked to a high-technology regular combat with counter-irregular operations.

In this way, the purpose of this work is quite unique. Many studies have analysed the contributions of network theory and of information warfare, as understood in the broader sense of warfare. Yet, another angle of approach seems more important in order to understand the significance of information revolution and of RMA/*Transformation*: their impact on strategic theory. The purpose here is to critically analyze the contributions or the problems that the spread of information technologies in its broad sense can bring, in relation to categories of classic strategic theory. The purpose here will be to analyse the consequences of what we will call "informationalization" on all strategic levels, but with a broader view than the sole art of regular warfare. If we only focus on the art of regular warfare, we would only reassess the confirmations which can be found in the works of the 1990s – often linked to their treatment by American researchers. Consequently, it seems necessary for us to include the irregular aspects of the art of war and their hybrid extensions right away.

In the first two chapters, we will revisit the epistemology of revolution in military affairs: first and foremost, it is necessary to understand its composition as well as its legitimation process (including throughout history). It is also necessary to understand its spreading in the strategic debate since it is the frame within which informationalization will develop. The goal will then be to re-examine the terminology of the aforesaid revolution, and also its relation with temporality, which we can question depending on the different time periods we are focusing on. The third chapter will focus on the disruptive nature of RMA/*Transformation*. Does it reflect a paradigm shift? We will analyse the political bases of strategic action – what will enable us to determine the real extent of the "revolution" – before incorporating the strategy of means analysis, which is a focal point when it comes to technology questions. We will then focus on operational strategy.

In this way, the next two chapters will focus on the historical construction of the process of getting to know your opponents in combat zones. We will refer to the question of intelligence, be it tactical or strategic, and also to the classical Clausewitzian referents such as "fog of war", "coup d'oeil" and "friction". We will thus study the theory of fluid and solid spaces suggested by Laurent Henninger, based on the works of G. Deleuze [HEN 13a, HEN 12a, BIH 14c]. The purpose here will be to show that our way of considering information collection as an action first derives from rationalities, which are linked to naval and air strategies (Chapter 4), before its attempt to be adapted to ground strategies (Chapter 5). Here, we can especially see the catalytic role of the Vietnam War, but we can also hypothesize that RMA/*Transformation*'s sole intent is to "render solid spaces more fluid".

Chapter 6 will get back to the process of "informationalization" in the doctrinal meta-referrer of armed forces, especially in Western countries[5]. The goal will be to focus on operations' kinematic nature, but also on the way of conducting a network-centric warfare. On this subject, our hypothesis is the following: RMA/*Transformation* is not finished, because the tools it enabled to create experience a dissemination and adoption process by

5 Also assimilated and understood as allies to the United States (Japan, South Korea, etc.). The processes linked to RMA also have an impact on other armies, such as the Chinese or the Russian army, for example. See the different contributions within [COL 15] or [LOO 08], [NEW 10] and [ADA 10].

irregular actors. As a consequence, we can witness the emergence of techno-guerrillas, embedded in a hybrid warfare mode, and which are the "answer" – a logical one, since warfare is a dialectic – to a quest of superiority from Western countries. Finally, Chapter 7 will seek to specify the attempt of Western countries to counter-adapt by studying the rationalities linked to the strike from a technical viewpoint, but mostly when considering its socio-strategic outcomes. These outcomes appear to be highly paradoxical, specifically due to the fact that, if it represents a "strategic attractor", technology seems to be an "impossible way out" of the invariants of strategy and, as such, of politics.

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1

Approaching Military Revolutions

The notion of military revolution appeared in the vocabulary of strategists, historians and political scientists during the 20th Century. However, before further examination, it is important to try and understand it, and to tackle three preliminary points. First, questions concerning military revolution appeared in two distinct realms. From one side, in the historical realm, in Roberts' work [ROB 56], who, in his research supported by tactical reforms of the Dutch army, tried to show a radical break with the recent past. Even though Parker [PAR 88, PAR 76] and Black [BLA 91a] criticized this thesis, it remains the most quoted study of the emergence of the debate on American RMA[1]. From the other side, in the realm of political and strategic science, the nuclear question was quickly perceived as a revolution in itself, since the goal of the armies was no longer to make war but to avoid it[2]. In both cases, these "revolutions" were techno-centered, and were respectively supported by the power of fire (artillery, individual weapons), maritime navigation techniques or the process of popular mobilization (through a slow process of state constitution [FIN 75, FOR 09]), and the scheme of the nuclear weapons and its vectors. In some ways, they already imply information flows.

1 In the field of history, this debate remains very much alive and burning. We can also refer to [CON 72] and [DOW 92].

2 We owe the first observation on the subject to Bernard Brodie who, it is said, after the explosion of the Hiroshima bomb, told his wife that he wanted to give up his research on classic strategy. Yet, from a practical viewpoint, the revolutionary outreach of political consequences of nuclear weapons will be widely questioned.

We can thus consider that the definition of RMA in the debate of a possible "revolution" in the 1990s quickly embraced the ideas that had been previously developed. In a first approach, RMA and its current state in the debate could be based upon the use of computers and network technology in operations conduct. Consequently, it could also be based on the importance given to information as a means of knowledge (of the tactical situation, whether it be operational or political) as well as a means of efficient forces activation. It might also find its basis in the importance given to forms of information prohibition (stealth technology, information warfare, psychological warfare and influence operations), in the positioning of precision-guided munitions fired from a stand-off distance, regardless of climate and operational conditions. Moreover, it might be based on the positioning of armed forces, which have a more gathered organization, but with a capacity to be placed more quickly on farther theaters of operations[3]. In a broader sense, we will base our study on a definition of the concept of military revolution as "a fundamental breakthrough in technology, doctrine and organization, which renders the existing methods of warfare conduct obsolete"[4].

Second, if the relevance of the definition "RMA" as a revolution can be questioned, we can reasonably assess that the notion of "military revolution" is historically relevant. Even historians who are reluctant to consider the concept of RMA as true revolution do not deny the relevance of the concept of military revolution. Third and finally, there are some keys and concepts that are necessary in order to fully understand the concepts of military revolution and RMA, and they will provide a framework for this chapter. The first is about the lexical varieties present under the notion of military revolution, which can be found in the American debate on RMA, especially when speaking about its political implications. The second refers to the categorizations of RMA done in the 1990s and of its analysts.

3 The focus here is only on the major categories of connotations assigned to RMA, which we find in its literature. We will come back to what it can cover more thoroughly [SLO 02].

4 Considered as being the first academic contribution on American RMA, this definition is sufficiently operating for now, even if the subjectivity implied in defining an innovation as a "fundamental breakthrough" remains problematic. More specifically, it does not include what we could call "military revolutions ontology" and what these military revolutions are or are not [MAZ 93, p. 16].

1.1. Lexical varieties

Three lexical categories of the conceptual object of "RMA" coexist in the field of strategic studies. They were the subject of a debate, between 1992 (when the first studies appeared on this subject) and 1998. Its goal, *in fine*, was to try and determine the magnitude of the phenomenon of accelerated technicization (meaning the introduction of new military technologies) of American forces. In view of its contemporary understanding, the concept goes back to observations made by the Soviet marshal Ogarkov in the beginning of the 1980s, of a *Military Technical Revolution* (MTR), and the observations of the American *AirLand battle* [FIT 87][5]. The latter was itself the result of a specific technological effort concerning DARPA[6], the second *Offset strategy*[7] and of the deep questioning – the *reform movement* – of the American forces' methods of action. The Soviet marshal, as he noticed the occurrence of this MTR in the United States, meant to adapt the Soviet forces to it [PAR 95].

It is supposed that this MTR may have solved the qualitative deficit of conventional Soviet forces by "synthesizing new technologies, evolving military systems, operational innovation, and organizational adaptation into a whole that was more powerful than the parts"[8]. And this regardless of whether it was based on a conceptual "system implementation" or on information and communication technologies as such, due to their interactions and their reticulation. Direct energy weapons, stealth technology, "strike-reconnaissance complexes" and reorganizations may then have given the USSR a straight comparative advantage over the United States[9]. In truth, the concept of MTR is the evidence that the Soviets considered the United States to be clearly

5 On the Russian perception of Ogarkov's considerations before the "application" of MTR before the Gulf War, see [FIT 91].

6 *Defense Advanced Research Project Agency*, in charge of the works linked to research and technologies in the United States.

7 See Chapter 5. The first offset strategy dealt with technologies linked to nuclear energy and to ballistic weapons.

8 [DAV 96, p. 15].

9 Ogarkov's plans, which were then passed on to Akhromeev at the head of general staff, were almost never implemented. For some, it would be due to a lack of political interest [SLO 02], whereas others consider that the USSR, by following the same path as the United States' strategic defense initiative, engaged in the MTR race. We must note that in the 1990s and 2000s, the different reorganization plans of the Russian army show many elements which call back to MTR as it was imagined by Ogarkov.

behind[10]. However, the concept was soon to be criticized as being too techno-centered (whereas only a few technologies were supposedly used). The concept may not show the doctrinal or organizational adaptation of the forces that implement it. In the same way, technology may have been conceptualized in a much too static way and may have failed to highlight the evolutions it could experience or even to report its own contributions [WAT 95]. In the end, MTR would supposedly be restricted to tactical and operational levels.

1.1.1. *MTR versus RMA*

At that time, in the United States, a second lexical field appears, and which attempts, in its varieties, to show the impact of said revolution on other scopes than the strictly technological and military ones. By re-examining Ogarkov's work, Andrew Marshall – who will play a major part in the debates over RMA[11] – favored the phrase "Revolution in Military Affairs", in order to better report the implications of political, doctrinal and organizational processes in the military institution by technology. All the most, in this sense, RMA implies an organization of technologies, which will be introduced in a given military system, and it also implies what their interactions will be [LAN 99]. With this mind, RMA becomes the "*process*

10 Actually, when studying the Soviet debates on the subject, Andrew Marshall will draw the conclusion that American efforts should be accelerated, so that Washington definitely ensures a technological superiority [TOM 07, ADA 08].

11 Andrew Marshall was the Head of the *Office of Net Assessment* (ONA) from its creation in 1973 until 2014. In charge of detecting the emerging threats against the United States, he answered directly to the Secretary of Defense and has had a major, yet discrete, role in the research institutions network. S.P. Rosen admitted that ONA "*was the first to develop the idea that the American military can be transformed by the revolution in information technology*" (quoted by [SCH 97]). He is said to be the first who foresaw the fall of the USSR, in 1977, based on its loss of economic steam. He also supposedly declared in 1980 that AIDS was a threat to national security. Said by a Chinese General to be the "*intellectual engine of American strategy*" (quoted by [WIN 99, p. 45]), ONA and Marshall are one and the same entity in most publications. From an economic educational background, Marshall was a research member at the RAND (1949). As he was always renewed by all administrations, his influence remains major ("the Church of St. Andrew") thanks to the schooling he brought to academics who also praised an RMA and who worked with him, such as A. Krepinevitch or T. Manhken, or also thanks to his close relation with a *think tank* such as the *Center for Security Policy* [KRE 15]. See also [ROS 10].

of socio technical transformation (which) *should be supported by a network of cultural and economic forces which takes a concrete shape during a time interval which is hard to define, yet easy to influence*"[12]. From the start, information plays a decisive role.

In practice, Martin Libicki will show the coextension, rather than the opposition, of the notions of MTR and RMA by telling that "*the most fundamental strategic challenge* (...) *is the conversion of a military-technical revolution into a revolution in military affairs*"[13]. Yet, this lexicon, which is the basis for all works on American RMA, will also be called into question. R.J. Bunker thus suggested the concept of *Revolution in Political and Military Affairs* (RPMA). According to him, the notion of RMA "*ignored the massive political ramifications that the development of future warfare will have over our society and government*"[14]. However, when put into practice, this concept only rarely appears in the literature and was mentioned rather than studied in-depth in the article. Also pertaining to this situation could be the American tendency to favor a relation based on the break from Jomini's concept rather than on the Clausewitzian continuity between the political and the military scopes as highlighted by Colson and Desportes Following this, the concept of *Revolution in Strategic Affairs*, suggested by Freedman, also takes us back to an attempt to broaden RMA to a political level [FRE 98].

With the same intention of broadening the field of RMA, Andrew Bacevitch stated at the United States, which benefited from revolutionary changes in their armies, were less subject to RMA than to a "revolution in security affairs" [BAC 96]. Like Bunker, the author's goal was to bring to light the impacts of the evolutions of the military institution on the international community – a combination of the social and political field – these impacts being seen as insufficiently highlighted. Retrospectively, we can consider that this influence does not go from the military to the socio-political, but that it proceeds from an interaction – particularly in view of information technologies, which come, for a great part, from the civilian world. This lexical quest will also find other ramifications. As he studied the concept of RMA in the scope of geopolitics, Richard Ek unveiled the concept of

12 [BAL 03, p. 19].
13 [LIB 94, p. 1].
14 [BUN 96, p. 9].

"revolution in military geopolitics"[15], based on the political and sociological consequences of the arrival of computers and new military technologies[16].

1.1.2. *Military revolutions versus RMAs*

In a third category of lexical fields, the attention paid to RMA as it was just starting to be conceptualized and to receive intellectual credit led several authors to study past revolutions from a strategic viewpoint and to take some distance in order to try and grasp differentiated magnitudes. To this end, an author such as Krepinevitch could consider, over time, the succession of several RMAs, based on four elements: technological change, systems development, operational innovation and organizational adaptation. These RMAs include the revolution of infantry (14th Century), of artillery (15th Century), of fortifications (16th Century), of navy rudders (16th Century), the military revolution of the 17th Century (with the linear order), the Napoleonic revolution, the revolution in land warfare (with the Civil War, the use of railway and of breech loading rifles), naval revolution (from the use of steam and the use of belt armor), revolutions of the interwar years (mechanization, aviation, information) and, finally, nuclear revolution [KRE 94]. Yet, very quickly, the author encountered the problem that some revolutions seemed to hold disproportionate impacts on military as well as political practices. Retrospectively, we can also argue that such a rigid classification ends in discrediting the interdependencies of what he defines as revolutions: indeed, phenomena of this magnitude do not appear *in abstracto*.

This led Murray and Knox [KNO 01] to differentiate the notions of "revolution in military affairs" and "military revolutions," thus converging with the debates of the historians in the 1950s. The first revolutions are then conducted by the military institution, which welcomes and incorporates technological innovations. Yet, they could also be based on deep political and social evolutions within society. By nature, an army, and the way it

15 However, the goal will be less to question the concept of RMA than to study its implications for the theory of geopolitics, particularly the postmodern theory of geopolitics [EK 00].

16 We could argue that "military geopolitics" more specifically take us back to a type of geostrategy, which almost always took into account the evolution of weapon systems. Mackinder himself thought that technology as such held a strong relation to geopolitics, since the first helped to put the second "into action", railways being the keys to mastering the *Heartland*, according to him [LON 99].

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