A revolution in military geopolitics?

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Abstract

This paper looks into the recent discussions within the US military community of a coming or current ‘revolution in military affairs’ (RMA) which is said to imply fundamental changes in military geopolitical imaginations and practices (military geopolitics). In a first step, an account of the rhetorical and the conceptual part of the discourse of the RMA is conducted. In a second step, the proclaimed RMA is situated within a wider cumulative technological and organizational development in warfare after the Second World War. In a third step, special attention is given to geopolitical incongruities or contradictions apparent within the discourse of the RMA, and between the rhetorical part of the RMA and more conventional geopolitical practices and imaginations. In a conclusion, the promise of an actor–network approach in further investigations of contemporary techno-geopolitical discourses and practices is spoken for. © 2000 Elsevier Science Ltd. All rights reserved.

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Introduction

Is geopolitics dead? This is the opening question in ‘Rethinking Geopolitics’, an anthology, edited by Ó Tuathail and Dalby (1998). The answer is no. Even if the big picture of Cold War geopolitics has changed, the struggle over power, politics and space continues, as witnessed for instance in Kosovo and Iraq. Thus there is still a need for geopolitical research, and it is necessary to rethink geopolitics, challenge traditional geopolitical assumptions and scrutinize conventional geopolitical imaginations. This has been done within the field of ‘dissident’ International Relations and critical geopolitics. Der Derian, for instance, influenced by Paul Virilio’s ‘dromology’ — speed—philosophy (Virilio, 1986; Virilio & Lotringer, 1997) — argues that

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technological development is propelled by technostategic and chronopolitical discourses, resulting in the rise of chronopolitics over geopolitics (Der Derian, 1990, 1992).

These thoughts have been further elaborated by Ó Tuathail and Luke, who argue that: ‘... the condition of the contemporary world order ... is one of ‘chrono-politics’ in which the power of pace is outstripping the value of place. Consequently, geographies are increasingly dimensionalized by speed not territory’ (Luke & Ó Tuathail, 1998, p. 72). Geopolitics, therefore, is not just a material power-play, but also hyperreal simulations in the realm of electronics (Ó Tuathail, 1993, 1997a). Dynamic processes of deterritorializations and reterritorializations are creating a postmodern vertigo, where: ‘The space of international politics has become a postperspectivist (s)pace’ and ‘global space appears ... more hybridized ... moving in multiple, decentered flowmations beyond the power of sovereign states’ (Ó Tuathail & Luke, 1994; Ó Tuathail, 1997b, pp. 44, 43, see also Luke 1993, 1994, 1996; Ó Tuathail, 2000a). The contemporary geopolitical condition is to a large extent characterized by boundary-transgressive tendencies and processes (Ó Tuathail, 2000b). Traditional notions of geopolitical concepts such as ‘inclusion’, ‘exclusion’ (Campbell, 1990; Paasi, 1996; Shapiro, 1996; Slater, 1997, 1999) and ‘security’ (Walker, 1990, 1997; Luke, 1991; Campbell, 1992; Dalby, 1992a,b, 1996, 1997, 1998a,b, 1999) have also been questioned by different critical approaches.

Furthermore, Ó Tuathail and Dalby (1998) argue that geopolitics is a multitudinous and decentered ensemble of representational practices, which can be divided into a three-fold typology. Firstly, there are practical geopolitics conducted by state leaders, foreign policy bureaucracies and political institutions connected to the state. Secondly, there are the formal geopolitics of different strategic institutes, think tanks and academia in general. Lastly, popular geopolitics are the geopolitical ontologies and imaginations canalized through popular culture. Practical, formal and popular geopolitics have different sites of production, distribution and consumption but are at the same time connected, and together they comprise the geopolitical culture of a spatial area (region, state, etc.). Ó Tuathail (1999a) also discusses a fourth type of geopolitics; structural geopolitics. Structural geopolitics focus on how global processes, tendencies and contradictions affect the contemporary geopolitical condition and its related geopolitical practices. This division is primarily done for heuristic purposes. In practice, these four types of geopolitics are intermixed.

In this paper, special attention is given to the formal geopolitics of the military establishment of the US. To be more precise, the intention is to look into the recent discussions within the US military establishment of a coming or current information-based ‘revolution in military affairs’. This ‘revolution in military affairs’ or RMA is said to imply a revolution in military geopolitical imaginations, according to its supporters. Among these advocates of a coming or current RMA, traditional geopolitical notions of territory, security and borders are re-evaluated and questioned. Traditionally, the military establishment in the US has had a realist, conventional geopolitical imagination, where the importance of physical territory and spatial distance has (often) been taken for granted and (geo)political demarcations have effectively included friends and excluded foes. Actually, spokesmen for a ‘revolution in military
affairs' suggest a geopolitical imagination quite similar to critical scholars like Der Derian, Ó Tuathail, Luke and Dalby. In some sense, these 'formal geopoliticians' act as much as 'technopoliticians' or 'knowledge politicians' as geopoliticians, arguing for the decreased importance of geographical dimensions like territory, physical distance and spatial borders.

This investigation (or deconstruction in a more general sense\(^1\)) of the contemporary discussion of a 'revolution in military affairs' and its implications for military geopolitical imaginations within the US military community is made in three steps. The first step is an account of the rhetorical and the conceptual part of the discourse of the (eventual) RMA. Keywords and popular expressions such as 'revolution in military affairs', 'information warfare' (IW), 'information operations' (IO), 'cyberwar' and 'netwar' are defined and presented together with a wider US defense context including the discussion of new war(l)d orders and 'new enemies', the claimed military disarmament and the up-rising of a post-heroic warfare. This is done in part two of the paper.

However, the account of the rhetoric and the conceptual dimension must be supplemented in order to give a more comprehensive illumination of the issue, and to avoid the danger of fetishizing the concern of discourse at the expense of institutional, sociological, material, cultural and geographical contexts (Ó Tuathail, 1996a). In the second and third step of the investigation attention is directed at global processes, tendencies and contradictions in the contemporary geopolitical condition (structural geopolitics) that seems to be embodied in the discussion of the information-based RMA. In the third part of the paper the proclaimed RMA is illuminated in the light of processes and tendencies like the role of computers in world politics, the cumulative technological development in warfare after the Second World War, and the enhanced importance of dual-use technologies in the contemporary U.S. military (second step). Lastly, the question whether the enhanced importance of information-based technology actually could be regarded as a 'revolution in military affairs' or a revolution in the US military geopolitical imagination and practice (US military geopolitics) is discussed.

In the fourth part, special attention is given to three geopolitical incongruities or contradictions apparent within the discourse of the RMA, and between the rhetorical part of the RMA and more conventional geopolitical deeds and imaginations, primarily emanating from the everyday practice of statecraft (third step). First, different types of organizational and technological networks and newly developed information technologies are considered to be crucial in the realization of a 'revolution in military

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\(^1\) For Ó Tuathail (2000b) critical geopolitics deconstruct ontological commitments and epistemological assumptions of conventional geopolitics, and maybe especially hegemonic geopolitical discourses. However, it could also be useful to examine contemporary, at first sight unconventional and non-hegemonic, geopolitical discourses, for at least two reasons. First, apparently unorthodox geopolitical discourses could very well be hegemonic in the future. Second, on closer examination, seemingly unorthodox geopolitical discourses may disclose very traditional notions of space and politics. In such a case, maybe an apparently unorthodox geopolitical discourse in a sense supports a hegemonic geopolitical discourse rather than, as a first impression could give, defying the hegemonic discourse.
affairs’. At the same time, the technical vulnerability of the same organizational and
technological networks creates, it is argued, unforeseen dangers and risks, not only
for the US military, but also for the whole US society. Second, at the same time
as technological and organizational innovations makes it possible to fight war with
unprecedented speed, essential geopolitical notions, geologist observations of the
political world and even ahistorical characterizations (Ó Tuathail, 1996b) still seems
to have a substantial influence over the conduct of war. One example is ‘Balkanism’
and its effect on US foreign policy towards Bosnia (Ó Tuathail, 1999a,c, 2000c).

Third, as was mentioned earlier, in the discussion of the ‘revolution in military
affairs’, it is argued that geographical dimensions decreases in importance. Innovations in new technology erase or blur spatial borders, spaces and other geopolitical
variables in the preparation for and conduct of war. However, during several
occasions in the end of the 1990s, like in Bosnia and Iraq, space and territory is
still deemed important, even critical, in US foreign policy and in what seems to be
the conduct of an ‘old-fashioned geopolitics’. In these conflicts and wars, informa-
tion-based technology is already implemented and used in combat, in order to
secure space and territory. Finally, in the conclusion, an actor–network approach in
research about the ‘latest manifestations of techno-political discourse’ in world poli-
tics (Ó Tuathail, 2000a), is spoken for.

A revolution in military affairs

US defense context — New Wor(l)d Orders, ‘new enemies’, ‘military
disarmament’ and post-heroic warfare

A wealth of theories about the future of international relations after the end of
the Cold War have risen since the late 1980s.² Liberal optimists saw the end of
the Cold War as the emergence of a new, peaceful era in world politics, while neo-
realists argued that the collapse of the Soviet Union had led to the creation of a
multipolar rather than a bi-polar world in which the rivalries between nation-states
continued (the most quoted one being Samuel Huntington but also Barry Buzan
(1997), a hybrid of these two viewpoints characterizes a third approach. In this
approach, the world is described as a mosaic, with zones of peace and zones of
turmoil. The zones of peace are held together by economic and military co-operation

² These ‘wor(l)d orders’ can be regarded as rhetorical elements of a broader context, encapsulating
the more general discussion of the future of the US defense from which the debate about a ‘revolution
in military affairs’ has emerged. These theories of the contemporary or future world politics is often
deeply rooted in a normative geopolitical imagination and an ideological interpretation or reading of the
world. As representations, with a rhetorical dimension, these theories can also be seen as proclaimed
‘world orders’. This is very pronounced in, for instance, former President George Bush’s declared ‘New
World Order’ (Ó Tuathail, 1993), Fukuyama’s thesis about ‘the end of history’ (Fukuyama 1989, 1992)
and in Huntington’s idea of the coming ‘clash of civilizations’ (Huntington 1993, 1996).
between advanced industrial societies while civil war, war between nation states and ethical and religious fundamentalism ravage the zones of turmoil (Singer & Wildavsky, 1993; Kaplan 1993, 1996).³

In the discussion of the future US foreign policy and the future role for the US military in the Post Cold War Era, particularly the neo-realist and the third, hybrid, approach have been intermixed with the related debate about (possible) new threats against foreign and domestic interests of the US. The ‘New World Order’, whatever it is called, is claimed to contain a wide spectrum of new antagonists and dangers, either connected to a certain territory or deterritorialized. Carter and Perry (1999) give the name ‘catastrophic terrorism’ to Post Cold War terror attacks outside the context of traditional war. Former Secretary of Defense Weinberger together with Schweizer (Weinberger & Schweizer, 1996) recite a long list of possible threats and require a stronger military buildup. Several warnings about ‘nukes on the loose’ have been made (Sopko, 1997; Betts, 1998; Falkenrath, Newman & Thayer, 1998) and some nation states have been declared as maverick states (Arnold, 1996) or rouge states (Klare, 1996). Klare argues that after the break-up of the Soviet Union, the military establishment responded by seeking a new raison d’être for its existence. Because of the absence of a really serious rival, the world was apprehended as an uncertain one, with unstable places linked to each other. In this new uncertain (multipolar) world, rogue states were identified due to their ‘anti-Western orientation’ and their involvement in ‘illicit proliferation activities’. Since at least two rogue states could cooperate, it was proclaimed necessary for the US to have a military capacity large enough to be able to handle two ‘regional wars’ simultaneously. According to Klare (1996), the establishment of this Rogue Doctrine in the US political society was a stunning success for the US military establishment.⁴

The creation of new geopolitical images of threats can be regarded as an attempt by the military community to prevent or minimize cuts in the military budget (Lindsay & Ripley, 1997; Greider, 1998). According to the US Department of Defense’s (DOD) 1995 Annual Defense Report, a 40% reduction in real terms of the military budget was made between the mid 1980s and the mid 1990s. In a sense, this military disarmament is correct. The DOD’s slice of the dollar has been reduced

³ These zones of order and disorder should not be regarded as unrelated to each other. Kaplan describes a dystopic scenario where destructive processes and a chaotic development in certain areas of the world threaten to seriously affect the ordered part of the world. In a much less sensational way, Luke and Ó Tuathail (2000a) emphasizes that failed states and chaotic places like Chechnya, East Timor and Serbia are not separated from global processes as economic restructuring, time–space compression and turbocapitalism (for a slightly different geopolitical interpretation of dependence and independence in the modern world-system, see Agnew & Corbridge, 1995, especially chap. 7).

⁴ This ‘problem expansion’ does not mean that the US foreign policy necessarily has changed very much even if relations with former adversaries have been reevaluated (Lindsay & Ripley, 1997; Nelson & Weisbrod, 1998). Ripley and Lindsay (1997) argues that in spite of large expectations of rapid and dramatic change in US foreign policy due to the turbulence in contemporary world politics, proved to be greatly exaggerated (see also Lowi, 1996). However, the one exception to the relative lack of change in the US foreign policy bureaucracy seems to be the Department of Defense, a keen advocate of a ‘revolution in military affairs’ (Ripley & Lindsay, 1997).
since 1970, when its net public spending was 25.2%, in 1980 was the corresponding figure 15.3%, in 1985 17.6%, in 1990 14.8%, in 1995 10.7% and in the year 2000 9.1%. The DOD’s defense outlays share of federal outlays was in 1970 39.4%, in 1980 23%, in 1990 23.1%, in 1995 17.2% and finally in the year 2000 14.8%. The National Defense’s share of the US GDP has decreased from 5.2% in 1990 to 3.6% in 1995 and 3.0% in 2000.

But even if the US military budget has been reduced if measured in percent or when the figures are adjusted for inflationary fluctuations, the claimed military disarmament can be questioned. Acheson (1998) reveals that defense spending for 1997 actually is higher than in most of the Cold War years before 1980. The claimed ‘military disarmament’ is only valid in comparison with the extraordinary defense figures in the 1980s, due to the Soviet invasion of Afghanistan and former President Ronald Reagan’s intentional build-up of the US military during the ‘Second Cold War’. Since the collapse of the Soviet Union, US defense spending is equal to the combined military spending of Russia, Japan, France, UK, Germany and China. In relation to the rest of the world, US defense spending has risen from 30.4% in 1985 to 33.3% in 1996 (Acheson, 1998, p. 98, see also Schöbner, 1998). Greider (1998) argues that this situation reveals the fact that the United States remains mobilized for world war. Even if the US military arsenal has been reduced to a certain degree, it: ‘... remains configured and equipped to confront a war of maximum scale, prompted by some large and unknowable threat that no one can yet name’ (Greider, 1998, p. viii). Due to actual budgetary reductions, Greider concludes that the US military–industrial complex is devouring itself, literally and tangibly, because it try to sustain existing defense institutions at the same time as it try to invent and build a future war-fighting capability. This probably precarious situation is further strained because of the struggle between the services (the Navy, the Air Force and the Army) over the dominance of new areas of weaponry and technologies (Adams, 1998; see also Alger, 1998).

The discussion about the DOD’s ‘slice of the dollar’ is maybe primarily a domestic question, even if it is related to the debate about the shape of the Post Cold War Era, especially Kennedy’s premonitory thesis (1987) about the risk of an ‘imperial overstretch’ for the US and Luttwak’s argument (1990, 1993) that the end of the Cold War marked an increased importance of geo-economics in world politics. The theory of post-heroic warfare is also a subject that contains both a domestic and an international dimension. According to Luttwak (1995, 1998), because of low birth-

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7 In the modern classic, Aaron Wildavsky’s ‘The Politics of the Budgetary Process’ (Wildavsky, 1984), these different budgetary strategies is labeled as ‘defending the base’ (guarding against cuts in the old programs), ‘increasing the base’ (inching ahead with existing programs) and ‘expanding the base’ (adding new programs).
rates and smaller families after the end of the Second World War, the public opinion is more intolerant towards casualties in military operations.

This is not only due to demographic causes, but is also closely connected to aspects of the ‘informationalization of geopolitical affairs’. According to Ó Tuathail (1999a, 2000b) informationalization is a set of related tendencies made possible through the new information, — communication — and transportation technologies (global telecommunication systems, media saturation, an infosphere of images and flows that makes ‘here’ and ‘there’ being sometimes ‘close’ and sometimes ‘distant’, etc.). Especially CNN and other global TV-networks have made a substantial impact on how the public opinion judge geopolitical affairs like operations in ‘wild zones’ conducted by the US military. The US operation in 1993 in Somalia was born, lived and died by the television camera (Adams, 1998) and Bosnia was constructed as a significant place in US foreign policy much due to the coverage made by the global media (Ó Tuathail, 1999c). Even if the national image may be at stake, the national security is necessarily not at stake in the public opinion’s eyes (Adams, 1998). Therefore, letting US military personnel die in operations at ‘the ends of the world’ is politically very hazardous. As Adams (1998, p. 75) concludes; ‘With a military that only wanted to fight wars where no one got hurt, advocates of information warfare found a ready audience for what they had to offer’.

The ‘revolution in military affairs’

The discussed ‘revolution in military affairs’ is to some extent a concept-driven discourse.⁸ For Gray, ‘postmodern war’, seen as a discourse system, is kept together by certain concepts, key ideas, metaphors and symbols. The system’s coherence is rhetorical (Gray, 1997). In a similar vein, Edwards (1996) argues that the Cold War also was literally fought inside a quintessentially semiotic space, through models, language, metaphor and iconography. Among the advocates of the ‘revolution in military affairs’ it is often important to notify who invented a special concept (see, for

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⁸ As a theoretical concept, discourse has a great number of meanings. Foucault admitted that: ‘instead of gradually reducing the rather fluctuating meaning of the word ‘discourse’, I believe that I have in fact added to its meanings: treating it sometimes as the general domain of all statements, sometimes as an individualizable group of statements, and sometimes as a regulated practice that accounts for a certain number of statements …’ (Foucault, 1972, p. 80). Based on the writings on Foucault and others, social scientists have further yet increased the amount of different definitions of discourse. Writing about ‘postmodern war’, Gray regards a discourse system as: ‘... the communicative practice in a specific domain of knowledge, and its practitioners are sometimes called a community’ (Gray, 1997, p. 95). For Edwards: ‘A discourse, then, is a way of knowledge, a background of assumptions and agreements about how reality is to be interpreted and expressed, supported by paradigmatic metaphors, techniques, and technologies and potentially embodied in social institutions’ (Edwards, 1996, p. 34). However, a discourse does not only involve words but also an ensemble of (regulated) practices, often material practices or practices which have material consequences. Weapons, techniques, rituals and traditions are all parts of the discourse of warfare (Gray, 1997). It is not enough space here for a complete analysis on the discursive formation of the ‘revolution in military affairs’. As a first step, the focus is put on the most important concepts in the discourse.
instance, Dearth & Williamson, 1996; Steele, 1998; Schwartau, 1998) and concepts is in general of central importance in the debate (Alger, 1998).

Maybe the most foundational concept is just ‘revolution in military affairs’ or RMA. According to Andrew Krepinevich, executive director of the Center for Strategic and Budgetary Assessments (CSBA), Washington, DC, an RMA occurs when the: ‘...application of new technologies into a significant number of military systems combines with innovative operational concepts and organizational adaption in a way that fundamentally alters the character and conduct of conflict. It does so by producing a dramatic increase — often an order of magnitude or greater — in the combat potential and military effectiveness of armed forces’ (Krepinevich, 1994, p. 30). The current ‘revolution in military affairs’ is the latest of several revolutions in military history, this one inevitable connected to the coming Information Age: ‘The Information Age has dawned in the armed forces of the US. The sight of a soldier going to war with a rifle in one hand and a laptop computer in the other would have been shocking only a few years ago. Yet that is exactly what was seen in the sands of Saudi Arabia in 1990 and 1991. Information systems have become essential ingredients to the success of combat operation on today’s battlefield’ (Powell, 1992, p. 370 in Adams, 1998, p. 55, see also Molander, Wilson, Mussington & Mesic, 1998, p. 3 for a similar statement). The 1991 Persian Gulf War is often described as the first information war and as the start for the information-based ‘revolution in military affairs’ (Campen, 1992; Powell, 1992; Garrity, 1993). The Persian Gulf War was in several ways a new type of war. Computers were a primary weapon in the US/UN alliance’s arsenal, together with geographical information systems and global positioning systems, ‘smart bombs’ with videocameras, and so on (Smith, 1992; Broughton, 1996; Gray, 1997).9

War and warfare in the near and more distant future is usually described as an information war and as information warfare. Information warfare (IW) was first coined in 1976 by the late Thomas Rona, a physics professor that was adjunct professor at the School of Information Warfare and Strategy, National Defense University based in Washington, DC and funded by the Department of Defense (Rona, 1976 in Dearth and Williamson, 1996). Rona introduced IW as ‘denial of information’ and a counter-intuitive way to cope with the threat of smart weapons (Campen, 1998a). Rona has later defined IW as a modernized version of the scorched earth principle, meaning: ‘...the destruction, incapacitation and corruption of the enemy’s infor-

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9 But at the same time the US led alliance relied mainly on traditional weapons in the war, including heavy bombs similar to Second World War munitions and on fuel-air bombs (Lever & Schofield, 1997). According to Robbins and Webster (1999, p. 157) estimations indicate that more explosive power was delivered in the Persian Gulf War than during the whole of the Second World War. It should also be mentioned that Soviet strategic thinkers already in the late 1970s forecasted an emerging ‘military—technical revolution’ (Garrity, 1993). This assumed ‘military—technical revolution’ would emerge, primarily as a reaction to the strategic situation in the Cold War (the mutual understanding of the impossibility of an eventual nuclear war without anyone else than losers) and not as a result of technological development (Cohen, 1996; Cooper, 1997). Through this ‘military—technical revolution’, a more tangible and contained form of warfare and manageable wars that not inevitably led to total destruction of the Earth, should be a possibility (Freedman, 1998, see also Gray, 1997).
mation infrastructure’ (Rona, 1996, p. 10). Several definitions of IW has been made, stretching from broad statements describing information warfare as epistemological warfare, concerned with changing peoples beliefs, behaviors and decision-making (Stein, 1996; Szafranski 1996, 1997) to narrower technical issues of cyberspace vulnerabilities (Schwartau, 1996; Libicki, 1996).

An example of a more ‘formal’ definition originates from the US Department of Defense’s 1996 Annual Defense Report: ‘IW seeks to achieve information superiority by affecting adversary information, information-based processes, and information systems while defending one’s own information, processes, and systems. Driven by rapidly advancing technology, the Department’s IW strategy provides a force which can operate with measured lethality and increased precision across the entire conflict spectrum far more effectively than any potential adversary. Defensive IW addresses the vulnerabilities inherent in DoD’s information systems and processes, while offensive IW addresses the opportunities presented by an adversary’s dependence on information systems and processes. IW is based on the need for, and use of, information in all phases of national activity — from peacetime operations through conflict’ (US Department of Defense, 1996, chapter 27).10

Since about 1997 the concept of IW has to some extent been replaced by the less ominous ‘information operations’ (IO) since IW or IO does not necessarily need to be primarily a military operation. Further, in IW or IO, the armed section of the engaged task force does not have to have a central or significant role to play in the operation taken as a whole (Schwartau, 1998; Stein, 1998). Even if there is a semantic difference between ‘warfare’ and ‘operation’, IW and IO mainly seem to quintessentially contain the same ambition; exert an influence on an opponent’s information infrastructure while protecting its own, by using its own’s information technology resources. For Larry Wentz, at the National Defense University: ‘Taking advantage of the power of information technology and integrating all aspects of information to achieve the full potential for enhancing military operations is referred to as Information Operations (IO). IO involve actions taken to affect adversary information and information systems while defending one’s own capabilities’ (Wentz, 1998, p. 205). In a US Army Field Manual Information Operations are defined as: ‘· · · continuous military operations within the MIE [Military Information Environment] that enable, enhance, and protect the friendly force’s ability to collect, process and act on information to achieve an advantage across the range of military operations. IO include[s] interacting with the global information environment and exploiting or denying an adversary’s information and decision capabilities’ (Starry & Arneson, 1996 in Freedman, 1998, p. 49).

Further, in both IW and IO, information and information technology are the central

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10 The Department of Defense’s Director of Information Warfare makes a similar but more extended definition. In a more popular account of IW, Schwartau argues that: ‘Information warfare is waged against industries, political spheres of influence, global economic forces, or even against entire countries. It is the use of technology against technology; it is about secrets and the theft of secrets; it is about turning information against its owners; it is about denying an enemy the ability to use both the technology and information’ (Schwartau, 1994, p. 291).
ingredients in the formula. Information is no longer just a matter of intelligence about an enemy. Rather it is a matter of routine, incorporated into the weaponry and decision-making systems themselves (Robbins & Webster, 1999). Gray (1998) however, calls it an irony that the concept of IW is almost completely unaffected by what is known about information theory, especially the limits of human knowledge and the impossibility of controlling or predicting the behavior of most complex systems. Attempts to problematize or diversify the concept of information are rare. One attempt is made by John Arquilla, Associate Professor at the US Naval Postgraduate School in Monterey, CA and David Ronfeldt, Senior Social Scientist at Research and Development Corporation (RAND) in Santa Monica, CA. They give ‘information’ three different meanings. First, information can be seen as an immaterial message or signal with a useful content, from a sender to a receiver. Second, information can be seen as a medium, a system whereby a transmission is sent from sender to receiver. Lastly, information can be regarded as an embedded physical property of all objects that exhibit organization and structure. All material objects embody information, as well as matter and energy (Arquilla & Ronfeldt 1996b, 1997).

Finally, two other definitions closely related to IW and IO are cyberwar and netwar. Cyberwar refers to conducting, and preparing to conduct, military operations according to information-based principles, trying to know all about the enemy while keeping the enemy from gaining necessary knowledge, and disrupting and/or destroying inimical information and communication systems, according to Arquilla and Ronfeldt in their seminal paper ‘Cyberwar is Coming’ (Arquilla & Ronfeldt, 1993). Netwar is defined as lower-intensity conflict at the civilian end of the military–civilian spectrum. In netwar, combatants are organized along computer networked lines or employ networks for operational control and communication (Arquilla & Ronfeldt, 1996a).

Cyberwar and netwar are, conceptually, quite indistinct. Cyberwar can relate to both ‘cyberspace war’ and ‘cybernetic war’. ‘Cyberspace war’ refers to a high-tech electronic war taking place in different cyberspace realms; a theme often used in popular novels and movies. ‘Cybernetic war’ derives from Norbert Wiener’s notions about ‘steering principles of control through feedback’ (Wiener, 1948). Cyberwar as a ‘cybernetic war’ is closely related to a typical military abbreviate, C4I (Command, Control, Communications, Computers and Intelligence) and more recently C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) or C4I/BM (Command, Control, Communications, Computer, Intelligence, Battle Management). Netwar can in a similar sense relate to an ‘organizational network war’ and an ‘electronic-based network war’. Netwar as an ‘organizational network war’ conceptually resembles ‘cybernetic war’, C4ISR or C4I/BM while netwar as an ‘electronic-based network war’ is similar to a ‘cyberspace war’.

However, these often encompassing but simultaneously unprecise concepts like RMA, IW and IO are usually described in other ways. A ‘revolution in military affairs’ is said to comprise four elements; operational innovation, organizational adaptation, evolving military systems and emerging technologies, linked to changes in technology particular within the civilian sphere of the economy (Cooper, 1997).
For Adams (1998), information warfare seems to break down into three distinguishable parts: perception management where information is the message, systems destruction where information is the medium, and information exploitation where information is an embedded physical property to be targeted. Among IW/IO applications can be mentioned electronic warfare, C²W (action against any element of an actor’s command-and-control system), energy weapons (lasers, particle beams, high-powered microwaves), deception in order to increase the uncertainty in obtained information, psychological operations against the human mind rather than against information technologies and information blockade against certain countries (Libicki, 1995; Gass & Romet, 1998).

Robins and Webster (1999, pp. 155–157) make one of the best accounts of the distinguishing features of IW. These are in order; first, the development of extraordinarily complex and durable systems of command and control to co-ordinate globally dispersed (chiefly US and NATO) military forces; second, very brief, even instant wars; third, the conduct of war relied on a relatively small number of professional soldiers and other kind of fighting personnel; fourth, the increased importance of the public opinion as a factor in the war effort makes it necessary for military leaders to carefully plan for and manage information from and about the war (as in the 1991 Persian Gulf War); fifth, the use of exceptionally sophisticated technologies, sixth, that the technologies of cyberwar becomes information saturated, it may even be possible to speak of a digitalization of the battlefield; seventh, IW only need to rely on the leading edge of industrial innovations like electronic engineering and aerospace (and no longer on the mobilization of the citizenry or the industry in general); eighth, the planning for IW is a planning for flexibility of response on the basis of the ‘certainty of uncertainty’ and finally; the high complexity makes it necessary to have many aspects of IW pre-programmed. Judgement and responsibility are often taken from the military personnel and placed in technologies.

Several of the features Robins and Webster mentions will be set out in the coming parts of the paper, but already here will the third feature, the arrival of the ‘knowledge soldier’ be developed. The ‘revolution in military affairs’ is said to imply an intelligent approach to future war. Within the information-based military the soldier is not just any soldier, but a well educated, intelligent ‘knowledge soldier’ using software and wetware together with physically destructive weapons (Toffler & Toffler, 1993; Libicki, 1996; Schwartau, 1996; Freedman, 1998; Gass & Romet, 1998).

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11 Examples of computer-oriented electronic warfare are Trojan Horses (viruses hidden within a program and triggered upon execution), ‘worms’ (viruses which obliterate or alter data as they bore through computer systems), ‘logic bombs’ (which embed themselves in an executable file until activated by a special event, like a particular date) and ‘spoofing’ (the insertion of extraneous data in an effort to cause a system to inadvertently disclose data) (Libicki, 1996; Schwartau, 1996; Freedman, 1998; Gass & Romet, 1998).

12 According to Martin Libicki, senior policy analyst at RAND, formerly senior fellow at the Institute for National Strategic Studies, National Defense University, there are four categories of psychological warfare; operations against the national will, operations against opposing commanders, operations against troops and finally, cultural conflict (Libicki, 1995).
These ‘knowledge soldiers’ will according to Friedman and Friedman (1996) become a social elite, relatively few but nevertheless more important than today. For Arquilla and Ronfeldt (1997) the appropriate role model for the information-based military soldier is no longer the undisciplined and impulsive God of War Ares. Athena on the other hand, being: ‘... the warrior goddess of wisdom who sprang fully armed from Zeus’s head and became the benevolent, ethical, patriotic protectress and occasionally wrathful huntress who exemplified reverence for the state, is the Greek god of war best attuned to the information age. Where warfare is about information, she is the superior deity’ (Arquilla & Ronfeldt, 1997, pp. 8–9). Further, the ‘knowledge soldier’s’ philosophical influences do not primarily derive from Clausewitz, but from the Chinese war theorist Sun Tzu. Over 2500 year old statements like ‘speed is the essence of war’ and ‘to subdue the enemy without fighting is the acme of skill’ (Sun Tzu, 1971) have become fashionable in the discussion of future warfare.

A revolution in military affairs?

The incorporation of civilian management ideas and technologies into the military

More analytically, two structural tendencies in the ‘revolution in military affairs’ can be highlighted; the incorporation of civilian management ideas into the military, and the merging of civil and military technologies (primarily into a new category, so called dual-use technology). adopting ‘business’ strategies to the military have become more common during the 1990s (Witol, 1998). Seemingly inspired by the industrial revolution in global commerce made possible much because of the new electronic technologies (Greider, 1998), the military establishment is creating images of itself as innovative, dynamic, efficient, flexible and so on (Blank, 1997; Cohen, 1997). As in parallel discourses about the governance of ‘learning cities’ and normative images of a modern management culture (Thrift, 1997, 1998), the world is uncertain and volatile and the military organization’s environment regarded as seen through a kaleidoscope. Superior adaptability is a necessity (Blank, 1997). The ‘revolution in military affairs’ from an organizational point of view then becomes a means for institutionalizing change and a tool to shape the military community to evolving strategic realities (Cooper, 1997). And (as contemporary management philo-
sophy claim) it becomes possible to at the same time reduce the military budget, enhance the technological efficiency and reduce the amount of military personnel.\footnote{In year 1990 The Department of Defense's military manpower amounted to 2.14 million and its civilian manpower to 3.22 million. In 1995 the military and civilian total manpower had decreased to 1.54 and 2.4 million respectively and in year 2000 the respective figures had shrunken to 1.45 and 2.15 million (figures taken from the National Defense Budget Estimates for FY2001 (the Green Book). Table 3-2 Personnel Authorizations. Active Military Personnel. Internet source: http://www.dtic.mil/comptroller/fy2001budget/). In constant Fiscal Year 2000 Dollars, the cost for military personnel has decreased from 107 413 million dollars in 1985 to 82 872 million dollars in 1995 and 73 723 million dollars in the year 2000 (figures taken from DOD's 1999 Annual Defense Report. Appendix B: Budget Tables. Internet source: http://www.dtic.mil/execsec/adr1999/adx9_b.html). The budgetary expenses for general science, space and technology however increased from 18.1 billion dollars in 1999 to 18.9 billion dollars in the year 2000, and is planned to increase further to 22.2 billion dollars in the year 2005 (figures taken from the National Defense Budget Estimates for FY2001 (the Green Book). Table 1-8 Federal Unified Budget Outlays by Function. Internet source: http://www.dtic.mil/comptroller/fy2001budget/). Among particular weaponry program is worth mention the US Army's AH-64D Longbow Apache Helicopter which is planned to cost 775 million dollars in the Fiscal Year 2001 (compared to 633.2 million dollars in FY1999), the US Army's RAH-66 Comanche Helicopter, planned to cost 614 million dollars in FY2001 (compared to 352.2 in FY1999), the Air Force's F-22 Raptor Fighter which in planned to cost 3957.9 million dollars in FY2001 (2356.7 in FY1999) and the Navy's Sub Launched Ballistic Missile Trident II, planned to cost 496 million dollars in FY2001, compared to 353.4 in FY1999 (figures taken from the Department of Defense Budget for Fiscal Year 2001 Program Acquisition Costs by Weapon System, February 2000. Internet source: http://www.dtic.mil/comptroller/fy2001budget/).}  

The merging of civil and military technologies or the appearance of information-based dual-use technology is in a sense related to the incorporation of civilian management ideas into the military governance, since this dual-use technology is said to, in theory, both enhance US industrial competitiveness and secure the unique position of the US military's strength (Alic, Branscomb, Brooks, Carter & Epstein, 1992; Nye & Owens, 1996). This process is interpreted with some concern. For Carter and Perry (1999, p. 198) defense is today forced to 'ride on the shoulders of America's commercial industry'. Alan D. Campen, adjunct professor at the School of Information Warfare and Strategy, National Defense University, refers to the 'civilianization of information warfare' as a: '... tectonic shift in roles that has lifted many traditional missions from the 'shoulder of the soldier' and apportioning them 'onto the backs' of unwitting, unprepared and, in some cases, unwilling civilians' (Campen, 1998b, p. 242). Using contemporary management concepts, Campen argues that: '... information services — the heart of military reins of control — are being outsourced to a host of (domestic and foreign) commercial entities' (Campen, 1998b, p. 245, emphasis added). According to Campen it has been over 130 years since the US military was so absolutely dependent upon a civilian information infrastructure. An estimated 85–95% of military communications are carried on commercial backbones today (Vlahos, 1998, p. 83).

But even if a feeling of frustration over the 'out-sourcing' of military control over the needed technology is expressed, it does not mean that advocates of IW like Campen depreciate the importance of the RMA and IW. Because of the military's heavy reliance on civilian information technology, information infrastructure, civilian
R&D etc., defense is now or should be everyone’s business (Campen, 1998b). The revolution reaches beyond the military sphere and affects the US society in general, and it is also necessary for civilians to understand the dynamics of the military transformation (Brown, 1996; Whitney-Smith, 1996; Steele, 1998). Facing new opportunities as well as threats, civilians and the US military are stuck with each other, as fellow voyagers on an uncertain journey beyond the cyberspace frontier (Campen, 1996a; Brown, 1996). Also among more popular accounts of the RMA or IW, these arguments are present. Adams (1998, p. 15) mean that: ‘... information warfare is something that will affect every man, woman and child on this planet’. And in the Tofflers’ ‘War and Anti-War’ (1993), the importance of changes in the military sphere for the whole society is especially noticeable. In a highly deterministic, dramatized and simplified account of the rise of a new historical third wave era, the military is the greatest hope for peace and the third wave (information) war has to be understood by the whole society in order to implement peace (anti-war).

An alternative interpretation of the increased importance of dual-use technology and the closer connection between civilian and military science and technology is that this actually is a cumulative process rather than something new connected to the development of information technology. For centuries the role of technology and science in the military and in warfare has been increasing. This tendency culminated in the establishment of a permanent war economy in the US after the Second World War that institutionalized innovation in the military and also led to the militarization of economic and scientific spheres of the US society in what Virilio has characterized as a ‘pure war’ (De Landa, 1991; Gray, 1997; Virilio & Lotringer, 1997). The military–industrial complex in the US, phrased by former President Dwight D. Eisenhower, could very well be renamed the ‘military–industrial–scientific–academic complex’, according to Rochlin (1997).

Therefore, the military community, the US grand strategy and the technological development can not be separated from each other. Military developments are central to the general technological project. Not least the military notions of ‘rational’ command and control are axial to broader understandings of relations of control and coercion (Robbins & Webster, 1999) at the same time as the historical trajectory of computer development is impossible to separate from the elaboration of grand strategy in the US foreign policy. Already in the 1950s, computer embodied the discourse of ‘containment’ towards the Soviet Union and its allies (Edwards, 1996). This relationship between the military and technoscience is embodied in the Research and Development Corporation (RAND). RAND was created in 1946 as a nonprofit corporation, at first under contract to the Air Force but soon formally independent

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15 As Schöfbanke (1998, p. 109) puts it: ‘Yet it is not clear what was the hen, and what the egg. Did the lack of real threats after the end of the Cold War lead to that kind of cyber– and infowar enthusiasm we now envisage as the driving force in Pentagon circles? Or was it the other way round, ... that perhaps the computer industry as a belligerent gang and camarilla is preparing its last and final (un–?)friendly take–over, the Pentagon itself? ... But the rapid and aggressive digitalization of the armed forces of the US and the preparation for all likely and unlikely cyber– and infowar scenarios give a tremendous boost for the whole communication and computer–business’.
(in 1948), by General Curtis LeMay. The RAND Corporation as a think tank and a military installation, whose primary product was ideas, epitomized the relationship between science and the military (Friedman & Friedman, 1996). RAND’s most important contribution was a whole way of thinking military geopolitics, a systems philosophy of military strategy, including system analysis (similar to cost–benefit analysis), game theories and the use of models, simulations and wargames (because of lack of quantitative information upon which to base their calculations of the conduct and outcome of an eventual Third World War). The RAND thinkers (as active in the discussion of a RMA and IW as during the Cold War) inhabited a closed world of their own in which calculations and abstractions mattered more than concrete experiences and observations (Edwards, 1996). In many ways, the planning for future war has become more important than fighting wars in the present (Gray, 1997).

**A revolution in military geopolitics?**

The question is if the manner in which wars are waged is undergoing a dramatic transformation which will enhance ‘American’ (US?) power and if a genuine technological revolution will transform the ‘American’ way of war, as Friedman and Friedman (1996) claim (see also Nye & Owens, 1996). Freedman in a cynical reply argues that ‘... attempts to produce schematic versions of history always seem to show the current moment as being one of fundamental transformation’ (Freedman, 1998, p. 9). Does the RMA represent a stage in a historical process or is it a vision that cannot be realized unless the visionaries grab the initiative (Freedman, 1998)? Is it an ontological transformation going on here (Olsson, 1979, 1980), through articles in widespread journals and newspapers (The Economist, 1995, 1997; TIME Magazine, 1995; Washington Post, 1995; Nye & Owens, 1996), that attracts more and more participants (myself included)\(^\text{16}\) afraid of not being a part of something which may be important, from the beginning? In a sense, this perceived risk of missing something potentially crucial and the eagerness to be a part of something new creates a dynamic of its own. Consequently, and partly paradoxically, this reluctance to

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\(^{16}\) In an early article in ‘Wired’, Der Derian wonders if it is possible to conduct a critical inquiry into the information war without becoming just another informant for it (Der Derian, 1994). I do not think so. But the natural following question is ‘what kind of informant?’ I agree with Ó Tuathail (2000b) in his opinion that critical geopolitics itself is a form of geopolitics, but a geopolitics that challenges hegemonic geopolitical imaginations. Even if I am ‘just another informant’ for the RMA and IW, I try at the same time to undermine the occurring arguments by pointing out theirs simplicities and possible unmentioned consequences in a larger geopolitical context. As an author I have an ethic responsibility to engage with what Sparke (2000) phrases the ‘other of the self’, in some way let my personal ideological opinion appear in the text. I confess that this article is very much an academic endeavor from my side, as I am born and raised in a country that have not been in war for over 150 years. I am aware of that I may be regarded as a critical but nonetheless disembodied eye in the sky, making my own ocularcentric objectification’s (dissection?) of a certain discourse going on in a country I just have visited, in my ‘hunt’ for an interesting field of inquiry that have not been sufficiently investigated. This awareness is, I think, a necessary first step and something that continuously has to be reminded, reevaluated and elaborated upon when space permits it. Here, I can only say that I am primarily interested in scrutinizing the machinations of geopolitical power, not in criticizing the US foreign policy or its military institutions.
miss something and the eagerness towards what is new enhances the apprehended importance of the subject in question. ‘Sure, we’re relevant in the new era, we subscribe to Information Warfare’ (Rothrock, 1997, p. 221).

For Forno (1998) the RMA is a ‘revolution’ because IW are being planned to wage war in the realm of cyberspace and an ‘evolution’ in the way information technology is used to support the warfighter, for instance the Army Force XXI Digital Soldier. The RMA can also be seen as essentially a quantitative change, but one which is of such significance that it has qualitative consequences (Tyrrell, 1998). A rapid technological innovation in the military sphere has been going on continuously ever since the World War II. The current period of technical innovation (munitions improvements, target acquisition, computers, etc.) has been underway for nearly three decades (O’Hanlon, 1998; Rochlin, 1997; Freedman, 1998). Among critical opinions, the RMA is primarily an attempt from the military-industrial complex to extend itself into the digitized, virtual world, expand war into cyberspace, continue the militarization of outer space and be able to kill over long distances and in real-time (Sterling, 1993; Gray, 1998; Schönbäcker, 1998). Also the importance of information and computers in warfare is not especially new. The US military has tried since the 1970s to apply artificial intelligence in battle in a so far futile attempt to clear the fog of war (Gray, 1997, 1998). Gray forcefully argues that the claimed RMA is an effort to ‘save’ war, redefine it and make it possible to handle (unlike ‘pure war’). This new kind of ‘impure’ war or postmodern war is: ‘... framed through computer metaphors and weapons as a manageable contest of intelligent machines in cyberspace, making it a much less horrible prospect’ (Gray, 1997, p. 252). If Gray is ‘right’, the transformation from pure war to impure war could be regarded as a revolution in military affairs. But it is a revolution in military geopolitics?

Freedman thinks that even if the restructuring process has been drastic, the essential features of the old order are retained in the ‘revolution in military affairs’. Even if important changes are under way, these changes do not necessarily point in one direction. The pure revolution may only be realized in quite specific and unlikely circumstances. But even if the technological trend has been evolutionary rather than revolutionary, more substantial changes is under way in the realm of strategy. Therefore: ‘If there is a revolution, it is one in strategic affairs, and is the result of significant changes in both the objectives in pursuit of which governments might want to use armed forces, and in the means that they might employ .... In this context, the issue behind the RMA is the ability of Western countries, and in particular the US, to follow a line geared to their own interests and capabilities’ (Freedman, 1998, pp. 9–10). Even if the RMA is phrased mostly in technical and organizational terms, the change in the military geopolitical context may be the most fundamental one. After the Cold War the geopolitical imagination in the US military is no longer constrained by a scenario dominated by an extremely strong military foe. Strategic thinkers and military planners have now the possibility to prepare to fight a war as they would like it to be fought using very lethal technology, as in the Gulf War (Freedman, 1998) or simply not intervene at all, as in Bosnia until March/April 1999. If Freedman is ‘right’, the revolution in strategic affairs in the US could be described
as a fundamental change in US military geopolitical imagination and practice (US military geopolitics).

The RMA and the postmodern geopolitical condition

The postmodern geopolitical condition is for Ó Tuathail (1999b, 2000b) a condition in world politics where the modern geopolitical imagination (Agnew, 1998) is openly challenged by structural geopolitical processes as globalization, informationalization, accelerated speed of interaction and communication and unforeseen consequences of technoscientific ‘progress’. The simultaneousness of postmodern geopolitical processes and still influential modernist geopolitical imaginations and practices creates incongruities and contradictions in world politics but not necessarily an incompatibility between postmodern and modern geopolitics. In this section, three aspects of the postmodern geopolitical condition present in the discussion of the RMA, are developed; networks, information and risks; speed and essential geopolitical imaginations and finally the blurring of borders and spaces and the topicality of a territorially rooted geopolitics. The presence and use of metaphors17 within these three themes are woven into the discussion.

Networks, information and risks

Today, a network society is by some said to take shape due to the development in information technology (Castells, 1996) and the network as a way to arrange, organize and describe information, technology, people and organizations in interaction has become more common. Within the discourse of the RMA, the comparative advantages of networks over hierarchies have been strongly emphasized. Networks have been described as adaptable, flexible, versatile, redundant, robust, resilient,

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17 Metaphors are used to describe something vague by relating it to something familiar, and to provide frames of reference for communication (Barnes 1991, 1996). Metaphor is therefore far more than a rhetorical device since it mediates the relationship among language, thought and experience and points to the process of learning and discovery (Buttimer, 1982; Edwards, 1996). The acquisition of new knowledge is therefore an inherently metaphorical process (Barnes, 1992). But at the same time: ‘The creation and maintenance of metaphorical understanding is an inherently political process and one that is more likely to be produced by people in power than by people who are relatively powerless. Power, at least in part, involves the ability to impose metaphors on others. The power over metaphor is thus not merely an academic device for encouraging new theoretical insights; it is in fact a material power which is constantly and unavoidably mobilized in everyday life to define what is thought to be true (and thus, as untrue’ (Cresswell, 1997, pp. 333–334, original emphasis). Metaphors becomes a linguistic expression which accentuates some dimensions (rhetorical as well as material) and ignores other, and encourages some thoughts and actions at the expense of others (Barnes & Duncan, 1992; Cresswell, 1997 see also Wilson, 1996). The metaphors expressed in different geopolitical and geoeconomical imaginations (like the idea of an immanent RMA), need to be problematized further by geographers (Ó Tuathail, 2000a). At the same time, however, these metaphors need to be handled with care and the limits of any metaphor need to be taken into consideration as they often depend on a very specific conception of space (Pratt, 1992; Smith & Katz, 1993; Ellis & Wright, 1998).
amorphous and aceanphalous while hierarchies often are regarded as rigid, inflexible, partial etc. (Arquilla & Ronfeldt, 1993, 1996a; Nichiporuk & Builder, 1997). The US military's organizational adaptation and technological development of a 'system of systems' is said to contain the 'informational edge' that will secure US hegemony (Owens, 1995; Nye & Owens, 1996; Friedman & Friedman, 1996). The Mongols way to fight war during the twelfth and thirteenth centuries becomes instructive in developing the foundations of cyberwar. With a decentralized command in the field, a communication system held together by fast riders and 'non-linear' campaigns and frontlines, the key to Mongol success was superior command, control, communication and intelligence, as in information warfare (Arquilla & Ronfeldt, 1993).

But both the network and its flows of information have been compared to a double-edged sword, with the Yin being the ability to use information to help and the Yang the dark actions of wrongfully using information to hurt people and damage organizations (Forno & Baklarz, 1999). On the right side stands the cyberknight (Adams, 1998) or the cyber samurai (Forno & Baklarz, 1999). The samurai's katana (sword), considered to be unsurpassed compared to other forms of iron-crafted art is flexible, rigid and has a formidable cutting power. The sword's inner core is made of softer metal, which gives it its flexibility while the hard layer of iron gives the sword its cutting edge. The US security against information warfare should be the same as the katana (Forno & Baklarz, 1999).

And the US defense against information warfare needs to be like a katana, because the same information technologies and interconnected networks that create 'Americas information edge' also makes the US more vulnerable to information warfare than any other nation (Campen, 1996b; Stephens, 1998). In 1991, Schwartau appeared before Congress and testified that 'An Electronic Pearl Harbour waiting to happen' (Schwartau, 1998, p. 56, an ominous warning that had been repeated many times, for instance in Washington Post, 1995). In 1998, The Center for Strategic and International Studies (CSIS, a private tax-exempt organization focusing on international public policy issues) in Washington, DC argued that: 'The more significant information warfare threat would likely resemble not Pearl Harbour, but instead Waterloo, where technology, planning, and careful execution were used as part of a long-range plan aimed at altering the world's political, military, and economic order' (Center for Strategic and International Studies, 1998, p. 2). So: 'America's technological strength is the envy of nations around the globe. But that strength, if not understood and protected, may also be our Achilles' heel .... In many ways, we [the US] are a technological Gulliver ... [and] our dependence on information technology ... brings exploitable weaknesses that, like the Lilliputians to the giant Gulliver, may enable our weaker adversaries to cause great damage to our nation' (Forno & Baklarz, 1999, pp. 104–105, 106–107, 106, see also Campen, 1998a).

And there are several kinds of Lilliputians to take into consideration. 'In today's electronic environment, many haters can become a Saddam Hussein and take on the world's most technologically vulnerable nation' (Center for Strategic and International Studies, 1998, p. xii). Further, there are the 'new breed of terrorists' and 'students of terror' (Kushner, 1998), 'predator' states, criminal syndicates, religious fundamentalists, ethnonationalist movements, militia organizations, disaffected
scientists and other representatives of the new threat paradigm and postmodern terrorism (Laqueur, 1996; Rathmell, 1998; Carter & Perry, 1999). The network constitutes two kinds of ‘network threats’. The first is the threat from the hostile organizational network like the worldwide Islamic terrorist infrastructure, which during a couple of hours is able to radically change its constellation (adaptable, flexible, versatile, etc.). The second category comprises electronic threats against crucial national networks and vital infrastructure, including electronic superhighways. The Information Age samurai is not the aggressive actor here, but the lurking ‘network ninja’, attacking from behind with no code of honor (Washington Post, 1995; Molander, Riddle & Wilson, 1996).

These unexpected negative consequences due to the increased importance of networks and information technology in the US (and other countries) and the notion of enhanced technological vulnerability fits into Beck’s (1992) modernist account of the ‘Risk Society’. Risk Society contains the growing problems caused by the technoscientific development itself. Even if Beck comments little on the origin of risk society, it can be said to have begun in 1945 with the construction of the first atomic bomb (Ó Tuathail, 2000b) and Oppenheimer as the first organic intellectual (Foucault, 1980). Technological vulnerability could in Beck’s terms be a consequence of the attempts to extend the technological edge, creating ‘blowbacks’ or boomerang effects whose impact hits harder with every new technological innovation. One example could be the Internet, in 1969 called ARPANet (Advanced Research Projects Agency Networks) and conceived as a guarantee for the invulnerability of military command-and-control functions in case of a nuclear attack. By means of its public, civilian use, the Internet has transformed itself into the very opposite of its original intention, ‘a veritable military nightmare’ (Stocker, 1998; Forno & Baklarz, 1999).

In the postmodern geopolitical condition countries like the US is forced to confront these ‘blowbacks’ or ‘side effects’. Often these ‘novel challenges’ and ‘formless risks’ are handled in terms of traditional analytics and poured into territorial bottles (Ó Tuathail, 2000b, see also Campbell, 1992, p. 8). This is also observed by some advocates of the importance of IW, as in the CSIS-report: ‘Although some US officials appreciate the significance of the strategic information warfare threat, many do not. More troubling is that US policymakers are responding to this twenty-first-century threat with twentieth-century thinking’ (Center for Strategic and International Studies, 1998, p. 1). In order to cope with risk society, self-confrontation and self-criticism is needed among the institutions of Western modernity (what Beck, 1992 and Beck, Giddens & Lash, 1994 terms reflexive modernization). But Gray (1997) claims that the evolution from pure and horrific modern war to impure and ‘idyllic’ postmodern war do not seem to concert the proponents of the RMA and IW. Instead, their primary interest is through a deeper understanding of future war, improve the warfare capacity in their own countries.

In at least two ways, the people who argue for the increased presence of network- and information-based risks connected to the development in technoscience seem to lack self-confrontation and self-criticism. First, technology is never questioned in itself. The faith in high-tech remains omnipresent, even after several technological
failures and superpower defeats in Vietnam and Afghanistan. Technology was then only missapplicated (Gray, 1997) or a tragic mistake as in the shoot-down of Iran Air Flight 655 in 1988 or the destruction of the Chinese embassy in Kosovo on 8 May 1999). Today, computers and information systems have become a panacea for the US military (Rochlin, 1997) and Gray (1997) fear that this technophilia and belief in high-tech weapons is going to lead to wars in the future. Second, even if risks are ‘open to social definition and construction’ (Beck, 1992, p. 23, emphasis in original) the advocates of the RMA do not express a consciousness of their own participation in the formulation of the danger of enhanced technological vulnerability. Instead, according to a simplistic and deterministic territorial logic of ‘here’ and ‘there’ the deterritorialized danger is just ‘out there’, independent of the practice and strategies of ‘us’ in here (Ó Tuathail, 2000b).

**Speed and essential geopolitical imaginations**

The French social theorist and architect Paul Virilio (1986, 1989, 1994, 1997, 2000) have noted the importance of speed in contemporary geopolitical processes (including warfare) and in late- or postmodern societies as a whole. Virilio, regarding himself as ‘a creature of the frontier’ (Zurbrugg, 1996, see also Der Derian, 1996, 1998a, chap. 1) extrapolates social tendencies and trajectories into the unknown (Luke & Ó Tuathail, 2000b). Because of Virilio’s predilection for overstatements, rhetorical bombs and the expression of almost paranoid fantasies, a literal reading of his texts is not consistent with the inward sense of his provocative conclusions. His remarks are however reasonably close to Harvey’s (1989) more historic-materialistic reflections about time–space compression and the idea of an ‘end of geography’ (O’Brien, 1992) in the sense that the importance of geographical distance is reduced by different vectors of speed (for a problematization of time–space compression, see Thrift (1995, 1997), and of the ‘end of geography’ discourse (Ó Tuathail, 2000a), see also Smith (1997) and Dodgshon (1999)).

In the discourse of a ‘revolution in military affairs’, speed is a tangible theme. Information warfare is characterized as continuous, simultaneous, accelerating and with instant feedback (Dearth & Williamson, 1996) which indicates a move to ‘just-in-time warfare’, an intentional analogy with the industrial ‘just-in-time’ principle (Hazlett, 1995). Future warfare will consist of short-duration combats, and the initial phase in the war may be the only period of war-fighting (Cooper, 1997; Davis, 1997). Some advocates of the RMA even consider it to be the beginning of an era of constant military revolutions primarily because technological development is so

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18 Because of the urgency for speed, the military is now seeking ways to computerize the decision-making processes of military encounters so humans is barely involved in the OODA (Observation — Orientation — Decision — Action) loop (Brown, 1996; Henry & Peartree, 1998; Robbins & Webster, 1999). The soldiers become encapsulated in technoscience and the visibility of their bodies are reduced (Gray, 1989). One consequence of this is that the traditional ‘male’ warrior is threatened since women now can serve as ‘cyborg’ soldiers everywhere within the information-based military organization (Gray, 1997).
rapid (Brown, 1996; Schwartzstein, 1996; Cooper, 1997). This imagination of an era of permanent RMA’s fit well into the notion of an accelerating world order based on fluid velocities of fast geopolitical processes (Luke & Ó Tuathail, 1998) or the expression ‘geopolitics on speed’ (MacIntosh, 1998).

The limited time of combat makes preparation for war crucial. The importance of logistics in future warfare creates a situation where time becomes an eternal preparation for war. For Virilio: ‘... the situation is no longer very clear between the civil and the military because of the total involvement of the economy in war — already beginning in peacetime’ (Virilio & Lotringer, 1997, p. 17). Baudrillard (1995) in a similar vein claims that ‘the Gulf war did not take place’, because in an era of constant preparation for war, war has no beginning or end and therefore do not take place in time (Bogard, 1996). Therefore ‘information peacekeeping’, is the: ‘... active exploitation of information and information technology so as to achieve national policy objections’, is an activity that relies almost completely on open sources available from the private sector and is the ‘purest form of war’ (Steele, 1998, p. 277, emphasis added). The mixing of times of peace and war are further exemplified in the fact that new, non-lethal weapons have been developed for US humanitarian operations, for instance in Somalia 1995, at the same time as the police in the US are interested in more militarized versions of SWAT teams because of increasingly well-armed criminals (Adams, 1998).

In the postmodern geopolitical condition the ‘dromo-intellectual’ (Luke & Ó Tuathail, 1998) or ‘chrono-intellectual’ dimensions are emphasized in geopolitics at the same time as essential and timeless interpretations and descriptions of the geopolitical world is highly relevant in world politics. A very obvious example is the power of ‘Balkanism’ and its effect on practical and popular geopolitical reasoning in the US during the 1990s (Ó Tuathail, 1999a,c, 2000c, see also Todorova, 1997). But not only ‘geopolitics on speed’ and essential geopolitical imaginations are intermixed. Only because it is technologically possible to fight ‘instant war’, it does not mean that every war is going to be ‘instant’.

Castells (1996) reminds us that instant technology-driven wars are the privilege of a few territorial states. Over the world, wars, half-ignored and forgotten by the ‘geoinformational empires’ (Ó Tuathail, 2000b) linger on for years. However, a marginalized war may shift from slow-motion war to instant war if it becomes included in the high-priority plans of world powers. Instant wars, and their technologically induced temporality are an attribute of information societies, as their possibility to exclude countries and events that are not central to the dominant logic of the ‘network society’ (Castells, 1996) or the logic of the transnational liberalism (Agnew & Corbridge, 1995). The time-space compression of technological warfare is in this sense not yet a global phenomena.

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19 Since Baudrillard writes in an exaggerated and hyperbolic style like Virilio, his provocative claim that the Persian Gulf War did not take place has been interpreted in different ways. For a critique, see Norris (1992) and for a defense of Baudrillard, see Merris (1994).
The blurring of borders and spaces and the topicality of territory

During the Clinton administration, the once firm division between what is foreign and what is domestic has been re-evaluated. In Clinton's first inaugural address in 1993, he announced that: 'there is no longer division between what is foreign and what is domestic' (Clinton, 1993 in Ó Tuathail, 2000b). The National Defense Panel (a nonpartisan, independent panel established in 1996 by the Secretary of Defense, with Krepinevich as a member) wrote that: 'The lines between domestic and foreign policy, intelligence and information, political and economic agendas, and military and law enforcement activities will become increasingly blurred' (National Defense Panel, 1997, p. 60). And in the President's Commission on Critical Infrastructure Protection, Clinton stated that: 'As borders open and the flow of information technology, money, and people across borders increases, the line between domestic and foreign policy continues to blur' (Clinton, 1997, p. 7). 'We must learn to negotiate a new geography, where borders are irrelevant and distances meaningless' (Clinton, 1997, p. ix, emphasis added).

Also in the discourse of the 'revolution in military affairs', the blurring of borders and spaces, actually the blurring of almost every geopolitical dimension is a recurring theme. Cyberwar is said to defy traditional rules of time and distance, speed and tempo (Forno & Baklarz, 1999). New kinds of threats and warfare are said to obscure levels of anti-state activity, distinctions between criminal and warfare activity, offense and defense, different kinds of actors participating in warfare, borders between strategic, operational and tactical measures and bureaucratic and jurisdictional demarcations (Arquilla & Ronfeldt 1996a,b, 1997; Dearth & Williamson, 1996; Molander et al., 1996; Davis, 1997; Hundley & Anderson, 1997; De Caro, 1998). Traditional notions of territories, borders and security seem to evaporate into new geopolitical and chronopolitical imaginations. Geopolitical borders have become porous (Nichiporuk & Builder, 1997) and Toffler and Toffler (1997) describe the current geopolitical condition as 'intermestic'.

As a consequence of this blurring: 'the major-regional-conflict standard on which the US military currently bases its planning is increasingly irrelevant as information systems become the more likely target of attack' (Center for Strategic and International Studies, 1998, p. xxi) and a 360 degree or 'spherical' defense (directed towards the domestic/inside as well as the foreign/outside) is called for (Steele, 1998). For Arquilla and Ronfeldt (1993, 1996b, 1997) the blurring of borders and spaces in war in the Informational Age, are apprehended through the metaphor of the Chinese game of Go. Deleuze and Guattari's treatise on Nomodology (Deleuze & Guattari, 1986) at least implicitly influence them, and the 'smooth' space of Go is contrasted toward the 'striated' space of chess. For Arquilla and Ronfeldt, chess is a metaphor for war in the Industrial Age.

In chess, two opponents face each other on opposite sides of an imaginary front. In the game, both sides move their pieces in order to gain control over the board's center, while they attempt to capture each other's pieces. The ultimate goal is to achieve checkmate. In Go, the situation is different. Whereas chess starts with a complete set of pieces, Go begins with an empty board. The board resembles a grid-
like chessboard with a number of squares. Each side puts pieces called stones anywhere on the board, one by one. But the stones are not placed in the squares but on the intersecting grid lines. Once placed, a stone can only be removed if it is captured or surrounded according to the rules of the game. Taking stones, however, is of secondary importance and gaining control over the sides and the corners are more important than occupying the center. The main goal in Go is to control more combat space than the opponent. Consequently, there is seldom a frontline. Instead action takes place anywhere on the board, in the battlespace (Arquilla & Ronfeldt 1993, 1996b, 1997). They continue:

Thus Go, in contrast to chess, is more about distributing one’s pieces than about massing them. It is more about proactive insertion and presence than about maneuver. It is more about deciding where to stand than whether to advance or retreat. It is more about developing web-like links among nearby stationary pieces than about moving specialized pieces in combined operations. It is more about creating networks of pieces than about protecting hierarchies of pieces. It is more about fighting to create secure territories than about fighting to the death of one’s pieces. Further, there is often a blurring of offense and defense — a single move may both attack and defend simultaneously. Finally, the use of massed concentrations is to be avoided, especially in the early phases of a game, as they may represent a misuse of time and later be susceptible to implosive attacks. This is quite different from chess, which is generally linear, and in which offense and defense are usually distinguished and massing is a virtue. Future conflicts will likely resemble the game of Go more than the game of chess (Arquilla & Ronfeldt, 1997, p. 11).

The description of chess and Go as metaphors for industrial and information-based warfare is not without objections. In chess, the pieces have different capabilities, different functions and follow different rules. In this sense, pieces in chess reminds more of the image of the high-tech network-based knowledge soldiers than the identical pieces in Go. And as any chess-player knows, a move in chess can very well be offensive and defensive simultaneously. Another comment worth mentioning is that Go, as several other metaphors and descriptions of the RMA and IW (the ‘cybersamurai’ with his *katana*, the ‘network ninja’, the Mongols as an early example of ‘cyberwar’, the interest in the philosophy of Sun Tzu, IW logistics as a ‘just-in-time warfare’) in some sense is of Asian, primarily Japanese, origin, and that they are almost all historical. Being a very sexy technological discourse (Gray, 1997), the RMA is even more seductive when these exotic metaphors and symbols are brought into the discussion.

In the postmodern geopolitical condition, the blurring of different geopolitical borders and spaces, and the topicality of territory are juxtaposed. Territory is still essential in war in the ‘Information Age’, as in the Persian Gulf 1991, 1993 and 1998 and in Bosnia in 1999. Taking control of the ‘infosphere’ is yet not enough, the physical territory is still a crucial arena or ‘battle theater’. Some of the topicality of territory can be connected to countermodernity or banal geopolitics; the geo-graphing
and/or re-drawing of borders and the ethnic cleaning of spaces from ‘Others’ (Ó Tuathail, 1999a; Dodds, 2000). But for Ó Tuathail (1999a) countermodernity is also present within conservative ‘national security’ establishments, in the habit of thinking in ‘Either–Or’ terms. For these ‘intellectuals of statecraft’, either threats and enemies are territorially contained, or the world order, the US hegemony and the world peace are impossible to maintain.

These territorial conflicts, wars and/or peacekeeping and humanitarian operations become a proving ground for recently developed information warfare systems and military information-based ‘just-in-time’ logistics, as in the 1998 Persian Gulf War or during the NATO bombing campaign, code named Deliberate Force, over Bosnia and Croatia in 1995 (Adams, 1998). Evaluations that have been done of operationalized information operations in Bosnia, however (Beavers & Shanahan, 1998; De Caro, 1998; Wentz, 1998), do not reveal that IW or IO is at the brink of becoming Realpolitik (Schöfbänker, 1998). Instead, they are matter-of-fact discussions about organizational improvement, logistical lessons to be learned, mission analysis, new IO formats and worksheets, and contain conclusions like that PSYOP (psychological operations): ‘... needs to streamline its coalition operation product approval and dissemination process and capabilities’ (Wentz, 1998, p. 221). Reading this evaluations, it is easy to almost forget that information warfare and information operations are lethal and destructive.

Conclusion — actor–network geopolitics?

During the second half of the 1990s, an interest for studies in the Sociology of Scientific Knowledge (SSK), and the overlapping field of Science, Technology, Society (STS) has emerged. Especially, the heterogeneous field of Actor–Network Theory (ANT) has interested several geographers (Murdock & Marsden, 1995; Bingham, 1996; Demeritt, 1996; Hinchliffe, 1996; Thrift, 1996; Murdoch, 1997a,b; Whatmore 1997, 1999). In the field of critical geopolitics, Ó Tuathail (1998) has shortly commented the work of Bruno Latour (1993). Fiercely rejecting technological determinism and the naturalization of technological and social solidity, ANT is able to encourage researchers to rethink relationships of power (Hinchliffe, 1996).

The actor–network approach differs from traditional network studies in sociology because it do not exclude nonhuman components (Callon, 1987). Actor–network mobilizes, and is constituted by a multiplicity of different actors (human and nonhuman, technological and organic), and keeps each other in position. The networks is more or less durable (in time) and more or less long (in space) (Whatmore, 1999). The actors only emerge within the relations established in the network and their forms, shapes and capabilities are determined by their interaction which each other (Callon, 1986). In this sense, ANT can be described as a ‘relationist’ theory (Murdock, 1997a; Whatmore, 1999). Because of the intricate complexity of the relations that constitute the network has become more and more unrestrained and resistant to modernist processes of purification (the separation between ‘nature’ and ‘culture’, ‘human’ and ‘nonhuman’, ‘object’ and ‘subject’, etc.) due to the develop-
ment in technoscientific practice, we now live in a nonmodern society (and has actually done that the whole time, we have never been modern) (Latour, 1993). In the nonmodern society, a kingdom of hybrids, quasi-objects, quasi-subjects, cyborgs and monsters, inhabitate and construct the networks (Ó Tuathail, 1998).

In critical geopolitics and ‘dissident’ IR, texts of Foucault, Derrida, Baudrillard and Virilio have been used to re-exam and scrutinize traditional geopolitical imaginations and hegemonic geopolitical practices. A useful complement to this research could be studies in ‘actor–network geopolitics’, an amalgamation of critical geopolitics/IR and ANT. Such an approach could be able to further illuminate how human and non-human actors constitute and relate to each other in those technoscientific and chronopolitical networks which create the processes of deterritorialization and reterritorialization that put the contemporary geopolitical condition in a constant flux. One early example of ‘actor–network geopolitics’ is Manuel De Landa’s ‘War in the Age of Intelligent Machines’ (De Landa, 1991). In this exhilarating book, humans are no more than pieces of a larger military–industrial machine, a war-machine with several separate levels evolved at their own pace, although often in interaction with one another. It is also worth to mention the works of Mark Elam (1997, 1998, 2000) about the culture and politics of remote sensing as a ‘dual-use’ technology that eradicates the demarcations between the civil and the military sphere, and as a cyborg technology that blurs the distinction between humans and machines. Methodologically, ANT often use an ethnographic approach in order to understand the social construction of scientific knowledge (Demeritt, 1996). Der Derian (1996, 1998b) uses a similar method in his investigation of the planning for future warfare. By visiting the annual Interservice/Industry Training Systems and Education Conference in Orlando (I/ITSEC) (Der Derian, 1998b) and Hohenfels Combat and Maneuver Center (CMTC) in Southern Germany (Der Derian, 1996) he exposes the technological determinism and the technoscientific optimism that characterizes the advocates of the ‘revolution in military affairs’. Further studies in a similar vein could be informative.

ANT should however not be accepted without reservations. Basset (1999) argues that ANT has a major problem with the concept ‘nonhuman agency’ and the claimed symmetry between humans and nonhumans. Can nonhuman actors be actors if they lack intentions and goals? Basset further claims that ANT provides a descriptive language without explanatory power. In a critique, Lee & Brown (1994) worry that ANT is running the risk of becoming a metalanguage in that it corrals all forms of knowledge into an absolute ontology and epistemology, and that ANT has been so successful in integrating all categorizations and distinctions that it has become a ‘final final’ vocabulary. In a sense, ANT may become just another ‘grand narrative’, representing all thinkable humans and nonhumans. Basset (1999) and Elam (1999) also notify that ANT and Latour’s ‘We Have Never Been Modern’ is weak on factors such as class, race and gender and that this disownment of large sections of the nonmodern world is in itself a performance of purification (Elam, 1999). Even if this critique is justifiable, ANT nevertheless is interesting because it: ‘... liberates the geographical imaginary of ethical community from the territorialized spaces of the embodied individual, the local neighbourhood, the nation-state, to trace the thre-
ads of ethical considerability through more dynamic, unstable and performed spatial orderings of flow, mobility, and synthesis' (Whatmore, 1997, p. 49).

ANT could be especially useful in further attempts to understand the complexities and paradoxes that have risen in the 'risk society'. Maybe a bit surprising, the possibility to combine ANT and Beck's important point about how 'our' (post/late/high) modernity produces risks which can boomerang back at 'us humans', has not so far been mentioned by geographers. In an ambition to create a better apprehension of how technoscientific and chrono- or dromopolitical practices create fast flowmations of geopolitical power that result in technostategic 'blowbacks', ANT seems to be a promising theoretical direction to choose.

Questions like how technological and geopolitical risks are canalized in different actor-networks and how the interaction between humans and nonhumans, and among nonhumans, creates these risks could maybe then be clarified in novel ways. Maybe if ANT is not a perfect collection of approaches, critical geopolitics and 'dissident' IR maybe could be able to more clearly point out how 'human' intentionally (and nonhuman unintentionally?) are swept into technoscientific actor-networks and transformed to (by 'humans' unintended) geopolitical risks. I think this would be worth a try.

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