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The Impact of the Office of Net Assessment on the American Military in the Matter of the Revolution in Military Affairs

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ABSTRACT The paper re-examines our understanding of the role played by Andrew Marshall in the development of American thinking about the application of information technologies to military systems and concepts of operation that is commonly referred to as the current Revolution in Military Affairs (RMA). It asks why Andrew Marshall, unlike many other American officials, saw the developments in this area as a potentially discontinuous, systematic change in military practice, rather than an incremental improvement. The paper identifies a range of prior experiences that made Andrew Marshall more sensitive to the possibility of an RMA, including his work on Soviet nuclear doctrine, and his exposure to sources of intelligence about Soviet military thinking in the 1970s and 1980s. It concludes that the 1990–91 Gulf War was not a major factor in the development of his thinking, and that that war, in fact, may have inhibited more innovative thinking about the RMA in the American military in general.

KEY WORDS: Net Assessment, Revolution in Military Affairs, Precision Guided Munitions, Defense Policy Board, Gulf War Air Power Survey

What was the role and impact of the work done by Andrew Marshall and those who worked for him in the matter of what is now called the Revolution in Military Affairs, which refers to the impact of information technologies, broadly defined, on military concepts of operation?¹ This question is an important one, for at least two reasons.

¹This essay was written on the basis of my reading of generally available material and on my personal impressions, and does not represent or reflect the views of Andrew

First, the extant conventional account appears to me to be intellectually insufficient. The conventional account, briefly put, is that Mr Marshall read Soviet military journals that referred to an ongoing Military Technical Revolution associated with the use of sensors and guided munitions. This revolution would give the United States the ability to neutralize Soviet tank formations with non-nuclear weapons on a geographic and temporal scale that had previously been possible only with the use of nuclear weapons having enhanced radiation effects and explosive yields of approximately one kiloton. He then circulated his own view that it was possible there was indeed such a revolution taking place. This view was expressed in an assessment written by one of the American military officers who worked for him, Andrew F. Krepinevich, in 1992.²

In the wake of the unexpectedly rapid and decisive victory of American-led airpower over Iraqi ground forces in 1991, this assessment attracted the attention of the senior leadership of the American military, and generated a wave of interest in military 'transformation' that reached its peak in 2001, but which was then submerged in the need to fight wars of counterinsurgency in Afghanistan and Iraq in the aftermath of the 11 September 2001 attacks on the United States.

This account appears to be insufficient because it does not attempt to answer the question of why Mr Marshall took so seriously the Soviet doctrinal writings. The possible significance of these writings was noticed by few, if any, other Americans. Moreover, the intellectual perspective of Mr Marshall on the phenomena highlighted by Soviet military journals was, on the account written by Dima Adamsky, distinctly unlike the common way of thinking about technological innovation in the United States. The United States, Adamsky argued, had an intellectual culture that was empirical and problem oriented, and less inclined to see the systemic character and non-linear impact of cumulative, incremental improvements in technology. This was, in part, the result of the fact that the United States lacked the kind of General Staff that focused on broad questions of the changing character

Marshall, the Office of Net Assessment, or the Office of the Secretary of Defense. Because it does not rely on the internal documents of the Office of Net Assessment or any component of the United States Department of Defense, and because it reflects my own personal judgments, and in some cases, speculations, it may contain errors or omissions, though I have done my best to avoid both.

²Andrew F. Krepinevich, *The Military Technical Revolution: A Preliminary Assessment* (Washington DC: Centre for Strategic and Budgetary Assessments, henceforth CSBA 2002), <www.csbaonline.org/4Publications/Archive/R.20021002/R.20021002.MTR.pdf>.

of war, in the manner of the pre-World War II German General Staff or the Soviet General Staff.³ Yet Mr Marshall was not only receptive to the Soviet perspective, but urged people to think about the possible systemic impact of this revolution on trans-oceanic power projection, an issue that, to the best of our knowledge, was not raised by the Soviet writings. Mr Marshall's thinking, thus, was even broader and more comprehensive than that visible in the Soviet writings, which is the opposite of what Adamsky suggests we should expect. It is an important historical and intellectual issue why, nonetheless, Mr Marshall did play the role he did, along with the late Albert Wohlstetter (1913–97), whose role in this matter has not been emphasized.

Second, the account is insufficient because it does not adequately capture the nature of the American reaction to Mr Marshall's ideas. The conventional account may mistake the reasons why the American military did not undergo the kind of transformation that might reasonably have been expected if the import of his thinking had had its full effect.

The following sections of the paper will attempt to sketch the nature of the dominant American perspective on the technological changes we associate with the Revolution in Military Affairs in the period beginning in the 1960s and leading up to the 1990s. They will then sketch what appears to me to have been the particular perspective brought to this matter by Andrew Marshall and some of the people with whom he was associated, insofar as this perspective helps us understand how the Office of Net Assessment responded to the Soviet military writings about what was then called the Military Technical Revolution.

Third, and finally, I will sketch out what the Office of Net Assessment did to try to promote thinking by the American military on this subject, and what the American military did in response.

Dominant American Perspectives on RMA Technologies

Adamsky argues that the tendency of nations like the United States, and, more generally, military organizations without Soviet-style General Staffs, will tend to see technological changes in a disaggregated manner. Improvements in the capabilities of an individual weapons system will be seen as only that, valuable, but a reflection of incremental improvements in the ability to execute existing missions. This does seem to have been the case in the United States. Barry Watts, for example, has done an invaluable service by documenting the early

³Dima Adamsky, *The Culture of Military Innovation: Comparing the Revolution in Military Affairs in Russia, the US and Israel* (Stanford UP 2010).

introduction of guided munitions into the American Air Force and Navy beginning in World War II. His meticulous study, in addition, shows how the early use of radar guided air-to-air munitions (the AIM (Airborne Interception Missile) Sparrow 7) in the Vietnam War in the era of vacuum tube technology actually led to a negative appreciation of the impact of these weapons, because of the unreliability of vacuum tubes and hand-soldered connections in weapons that were deployed in combat environments. The substitution of solid-state electronics into the same systems drove up their reliability and their effectiveness, but the early problems created a lasting impression.

Moreover, the nature of the fixes to the reliability problems encouraged the perception of incremental improvements in an existing system, rather than the herald of a new way of warfare. Furthermore, US Air Force analysis did not appreciate the true impact of the widespread and successful use of precision guided air-to-ground munitions by the United States in the war against North Vietnam. In the first use of laser guided bombs in that war in 1969, the US Air Force released 1,601 2,000lb bombs with laser guidance packages, of which 85 percent hit within 9.6 feet of their targets, with an operational reliability rate of 85 percent. In the Operation 'Linebacker' air campaigns against North Vietnam in the period February 1972 to February 1973, more than 10,500 laser guided bombs were released on targets, and 9,107 landed within 25 feet of their targets. This compared with an average 500 feet circular error probable of F-4 Phantoms dive bombing heavily defended targets. The Air Force histories of this campaign, however, emphasized the impact of B-52 heavy bomber strikes using unguided bombs.⁴

Watts did not speculate on the causes of this perspective in the US Air Force, but later accounts of the First Gulf War do suggest what may have been part of the reason for this relative lack of emphasis on the new guided air-to-ground munitions. The US commander of the air forces deployed to the Central Command (CENTCOM) theater, Lieutenant General Charles Horner, was briefed by Colonel John Warden on 20 August 1990 on the plan for the bombing campaign against Iraq, 'Instant Thunder'. This plan envisioned the use of precision-guided munitions to execute rapid accurate strikes against Iraqi command and control targets at the start of the war. Horner is reported to have reacted as follows:

No sooner had Warden begun the briefing than Horner began to assault him with criticism, complaints, and questions,

⁴Barry D. Watts, *Six Decades of Guided Munitions and Battle Networks: Progress and Prospects* (Washington DC: CSBA 2007), 9, 184, 190.

deriding the advice he was getting ... Warden's discussion of precision-guided munitions was off base. Warden should be talking about the precision-guided delivery of weapons. This was a reference to the F-16, one of Horner's favorite weapons, which did not have the capability to deliver laser-guided bombs, but which had the supposed capability to drop its dumb bombs with great accuracy at low altitude using its radar bombing system.⁵

To be sure, there were genuine limits on the utility of laser guided weapons. They were useable only in good weather, and they were still relatively expensive. But perhaps more importantly, laser-guided munitions reduced the importance of fighter pilot skill in the delivery of weapons, and so were a challenge to the importance an established social hierarchy. There were, as a result, powerful social pressures to see these weapons not as something that would require a major change in military concepts of operations, but as simply one more way of doing what the fighter pilots of the Air Force were already doing.

In addition to precision-guided weapons, improvements in the ability to communicate information about the location of moving targets in order to make possible the use of weapons against them were crucial to the Soviet concept of the Military Technical Revolution. But from the standpoint of the United States, improvements in US Army tactical communications had been something on which the Army had working for decades to improve, with great difficulty and with only limited results. In her thorough history of Army tactical command and control up through the 1980s, Elizabeth Stanley found only slow and marginal progress, which had not changed the core tasks of the Army.⁶ The judgment that Army command, communications, and control was improving incrementally was generally shared at MITRE, the Federally Funded Research and Development Center (FFRDC) devoted to that mission area.

While far from being a comprehensive survey, these observations tend to support the view of Adamsky that the United States would not, and did not, regard the developments identified by the Soviet military as revolutionary. But Mr Marshall did. Why?

⁵Michael R. Gordon and General Bernard E. Trainor, *The Generals' War* (Boston: Little Brown 1995), 92.

⁶Elizabeth A. Stanley, *Evolutionary Technology in the Current Revolution in Military Affairs: The Army Tactical Command and Control System* (Carlisle, PA: Strategic Studies Institute/US Army War College 1998).

Intellectual Background of Andrew Marshall and the RMA*The Impact of Work on Intercontinental Strategic Warfare*

While the Soviet Military Technical Revolution and the American discussion of the RMA focused on tactical and operational level non-nuclear war-fighting, the work done by Mr Marshall at the RAND Corporation in the period 1950–69 revolved around the problems of intercontinental nuclear warfare, and appear to have prepared him to understand the impact of information technologies on the conduct of warfare that were revolutionary, system-level improvements. The centrality of deterrence in American thinking about US–Soviet strategic nuclear interactions led him to be concerned with the how it was that the Soviet leadership thought about the character of a possible exchange of nuclear weapons. Deterrence existed in the mind of the adversary, and so understanding the mind of the adversary was crucial to the task of designing and building an adequate deterrent capability. Beyond that, critical events led Mr Marshall to see, concretely, that American efforts to think like Soviet leaders were seriously flawed, because they failed to take into account the political and organizational imperatives that shaped Soviet thinking, and which led the Soviets to conclusions very different from those which Americans would think were rationally optimal.

Specifically, in the days before the availability of good overhead reconnaissance intelligence about the Soviet Union, efforts by RAND analysts to put themselves into the shoes of Soviet military commanders led them into gross error. It was assumed, for example, that the Soviet Union would build its bomber bases far from the coasts and along the trans-Siberian railroad lines, in order to make them less vulnerable to American bombers. Soviet bomber bases, in fact, were located in the eastern areas of the Soviet Union and on the Far Eastern coast, not in the interior of Russia, because that was where Soviet air bases had been constructed in the 1930s and 1940s. Mr Marshall, along with Joe Loftus, who had come to RAND from Air Force Intelligence, was one of the few analysts at RAND who had access to intelligence that showed that this assumption about Soviet air bases was incorrect.

It was similarly assumed that because the Soviet Union focused on land war in Europe, the Soviet air forces would be dominated by tank-buster aircraft. But the Soviet experience of a decisive German air strike against Soviet airfields at the beginning of World War II and the prospect of American nuclear attack had led the Soviet Air Force to devote the bulk of its resources in this period to air defenses, and not to ground attack aircraft. The RAND political science department had only looked at doctrine written in the period when formal Soviet doctrine was dominated by Stalin, and not the professional military,

and did not reflect what the Soviet military was doing. Nuclear weapons were formally downplayed by Stalin while the United States had nuclear superiority, but the development of nuclear weapons-related forces was the major task of the Soviet military. All the fighter aircraft that were built were interceptors that would deal with American strategic bombers. Half the stainless steel made and half of the concrete poured in the late 1940s was devoted to nuclear weapons-related projects, for example. It was not until the middle 1950s that written Soviet doctrine became serious and an important source of information.

Discrepancies such as these led Mr Marshall to study what the Soviet military wrote, and to take these writings seriously. In the 1950s, Soviet doctrinal writings referred to the introduction of nuclear weapons, long range missiles and 'cybernetics' or the first generation of data-processing capabilities, as a revolution, one of a series of revolutions that included the revolution created by the mechanization of ground warfare, military aviation and the use of poison gas used for military purposes. In addition, Mr Marshall's unusual access to intelligence about the Soviet Union's nuclear forces gave him a sense of the scale of the transformation the Soviet military had undergone to deal with the nuclear revolution, in terms of its force structure, and concepts of operation.

Independently, Albert Wohlstetter also was focused on problems of intercontinental strategic warfare. In his case, however, the focus was on making deterrence more credible by making it more useful by reducing the large-scale damage to civilian populations that would result from strategic nuclear attacks on Soviet military targets. Wohlstetter developed what he called the 'dual criteria' of being able to destroy targets in intercontinental warfare while not doing unwanted collateral damage. This led Wohlstetter to be interested in improving the accuracy of strategic nuclear weapons. This would make it possible to reduce their yields without reducing the amount of desired damage that they could do. Wohlstetter came to direct a study done for the Defense Advanced Research Project Agency in 1975, involving a group of analysts from the military and defense industry, that included Mr Marshall, and which produced the Long Range Research and Development Planning Program. One of the major findings of the report was that a revolutionary change in the character of intercontinental strategic warfare was imminent. Improvements in accuracy would make it possible to give strategic weapons armed with non-nuclear warheads the destructive power against military targets that previously had only been achievable with nuclear warheads. To quote the report, the observable trend:

very strongly suggests that non-nuclear weapons with near zero miss may be technically feasible and militarily effective. If so, such

non-nuclear weapons, under a wide range of circumstances, might satisfy the United States and Allied damage requirements that now require the use of nuclear weapons. Near zero non-nuclear weapons could provide the National Command Authority with a variety of strategic response options as alternatives to massive nuclear destruction.

There is no reason to believe that Mr Marshall shared Wohlstetter's view that strategic level deterrence would be enhanced by reducing the collateral damage done by nuclear weapons. Indeed, his written work at RAND in 1960 argued that deterrence of the Soviet Union could be enhanced by the ability to inflict very large-scale damage on Soviet urban centers. Very large yield nuclear weapons would reliably destroy both Soviet military targets and large portions of urban/industrial centers, which had a major role in Soviet war production and post-nuclear war recovery plans.

Nonetheless, Mr Marshall was in contact with Albert Wohlstetter in this period, and exchanged ideas with him informally, and formally when Mr Marshall's office supported the newly established Defense Policy Board created in 1982 that was chaired by Ambassador Seymour ('Sy') Weiss and on which Albert Wohlstetter and Mr Marshall sat. At the meetings of the Defense Policy Board in 1982 and 1983, Wohlstetter made the case not only for much more accurate strategic weapons (long-range cruise missiles employing radar or optical terrain mapping techniques to update their location information were achieving greater accuracies, but could be made even more accurate with then available technologies), but also for a new intelligence data base to support their operations in wartime. Very accurate low-yield non-nuclear strategic weapons would require information, not about the location of factories or military bases, but about the floor plans of enemy buildings and offices so that target planners could know which room, or even which corner of a room to hit with a weapon, so that the right piece of machinery would be destroyed without destroying the rest of the building. This may have been one of the first occasions on which major shifts in American force structures, related command and control, and intelligence functions were proposed on the basis of emerging technologies, in a manner that was recognized as revolutionary, because it would substitute non-nuclear for nuclear weapons.⁷ It was a clear precursor of the Presidential Commission on Integrated Long Term Strategy

⁷This thinking also affected my own work. See Stephen Peter Rosen, 'Conventional Combat and the Nuclear Balance', *Journal of Strategic Studies* 10/1 (Spring 1987), 36–61.

(CILTS) chaired by Wohlstetter and Fred Ikle and which produced a final report entitled 'Discriminate Deterrence'.⁸

Finally, the impact of very accurate Soviet wire guided anti-tank missiles used in the 1973 Middle East war led to studies written by Jim Digby at the RAND Corporation suggesting that major changes in military operations might follow from the revolution in accuracy. Marshall was also struck by the importance of this new technology, but was also interested in the question of whether existing American military organizations had the flexibility adequately to take full advantage of this revolution.

The Long Term Defense Competition between the US and the Soviet Union

One of the major intellectual contributions made by Mr Marshall in the 1970s was the development of the concept of long term peaceful competitions between opposing defense organizations. He argued that the existing sensitivities and predispositions of organizations were triggered by actions taken by their adversaries as they developed their own forces. Some of those reactions were more harmful than others. By understanding those sensitivities and predispositions, an adversary could, over a period of time measured in years or decades, choose what to build and when to build it, in order to elicit the least harmful of the possible enemy reactions. By understanding the fears and sensitivities of an adversary, programs could be initiated or reinforced in ways that reduced the confidence of the adversary in his ability to win an engagement or a war. This could enhance deterrence, and also lead the adversary to cease its efforts even to compete with the United States in certain areas.

As was the case with the study of strategic nuclear deterrence, the focus on the long-term competition with the Soviet Union led Mr Marshall to be very interested in Soviet perceptions and sensitivities. In the period beginning in 1978, the Soviet General Staff began to take notice of new United States programs for the North Atlantic Treaty Organization (NATO) area that were meant to redress the emerging quantitative and possibly qualitative superiority of the Soviet forces facing NATO. These included thinking by then USAF Europe commander General John Vogt, the officer who had pioneered the use of laser guided weapons against North Vietnam in 1972, on very deep air strikes into Warsaw Pact territory to disrupt the echeloned forces that were en route to the battlefield with NATO. It also included a program that came to be called 'Assault Breaker' and

⁸Available online at <<http://handle.dtic.mil/100.2/ADA277478>>.

which used airborne sensors that could do wide area searches to locate armored formations on the move and then cue ground-based missile launchers to fire on areas over which the missiles would dispense autonomously guided sub-munitions armed with self-forging projectile warheads to destroy tanks on the move. This was characterized by the Soviet General Staff as a reconnaissance-strike complex, and was assessed as having the destructive capacity against a tank battalion equivalent to a one-kiloton enhanced radiation warhead.

Initially, this was not perceived by Mr Marshall as a revolution in military affairs, but as a Soviet sensitivity or vulnerability that could be used as a component in the long-term competition with the Soviet Union, either to enhance deterrence or to force the Soviet Union to divert resources away from offensive capabilities and towards defenses against this new problem, to include, for example, long-range air defense missiles that would target the airborne wide-area sensors. Soviet military leaders were concerned that they did not have the necessary competence in electronic data processing to take advantage of it. This thinking became public in May 1984 with the publication of an article in *Red Star* by Marshal Nikolai Ogarkov assessing the impact of wide area sensors, guided munitions and automated command and control.

But in addition to the Soviet reaction to American technological developments, we can speculate on the basis of recently published work that there was sensitive intelligence available to a small number of Americans that made them more receptive to the possibility of a military revolution being developed by the Soviet General Staff. It is possible that this thinking on the part of Mr Marshall was affected by the availability of the human intelligence coming from the Polish officer, Colonel Ryszard Kuklinski, who was assigned to the Warsaw Pact General Staff, and the Soviet officer, General Dimitri Polyakov, who was assigned to Soviet military intelligence headquarters in Moscow in the period 1976 to 1979. These two officers are said to have had access to General Staff documents outlining the Strategy of Deep Operations (Global and Theater) which had been compiled in the period 1977 to 1986. This information was circulated within very limited circles of Americans in 1981. The American defense intelligence officers who managed and analyzed this material included John Hines, who came to work for Mr Marshall, and Phillip Petersen. The work of these analysts suggested that the Soviet Union sought to wage and win a war on a continental scale within a very brief period of time, without the use of nuclear weapons but using newly formed Operational Maneuver Groups that integrated ground, fighter-bombers, special operations, and engineering units. This doctrinal work was associated with Soviet military exercises in the

late 1970s, which culminated in a massive military exercise in September 1981, *Zapad-81*. In the words of Diego Ruiz-Palmer, who worked for Mr Marshall at that time, ‘we monitored this exercise intently. [Marshall] Ogarkov showed that over the past three years he had studied the ways in which the Americans’ “assault-breaker” would work, and what actions could be taken to minimize their impact.’⁹ This intelligence may have stimulated the thinking of those who were exposed to it. It made them very conscious of the revolutionary possibility of warfare extended in geographic scope, compressed in time, and succeeding without the use of nuclear weapons on the battlefield. In other words, the Americans exposed to this intelligence were not asked to believe in a possible American revolution in military affairs, but an actual threat created by a revolution in military affairs developed by the Soviet Union.

The intelligence work may have continued through Army channels. Lieutenant General William Odom, then Army Chief of Staff for Intelligence, with whom Mr Marshall had contacts in the early 1980s, sponsored his own work to analyze and codify Soviet military doctrine in what he called ‘the Soviet Battlefield Development Plan’ in order to guide the development of American military doctrine to counter it.¹⁰ Mr Marshall did have contact with General Odom in the development of the assessments of the military balance in the NATO-Warsaw Pact theater, and in the East Asian theater. One of the members of Odom’s staff, Major Garrett Ruehl, came to work for Mr Marshall in 1982 or 1983. Odom then published an article in *Foreign Affairs* winter 1988/89 in which he set out Soviet thinking on historical revolutions in military operations. Also in the 1987–88 period, Mr Marshall was the director of the CILTS research on the future security environment. This report also focused on the revolution in military technology, and sustained Mr Marshall’s interest in the RMA.

There was, therefore, a stream of military intelligence work beginning in 1981 on Soviet thinking about an ongoing revolution in military affairs that would make possible the use of non-nuclear weapons that would have an impact on ground warfare comparable to that which could only have been achieved with tactical nuclear weapons. Mr Marshall may have been exposed to this intelligence, and so may have been primed to ask the question that led to the 1992 assessment: was the Soviet General Staff right to assert the existence of a revolution? His attitude was certainly the result of his ongoing search for points of sensitivity and vulnerability in the Soviet military, and

⁹Gordon S. Barrass, *The Great Cold War* (Stanford UP 2009), 211–16, 267.

¹⁰The Odom papers on this subject and others have been donated to the United States National Archives.

may have also reflected his early exposure to sensitive intelligence and the thinking of Albert Wohlstetter.

The Impact of Mr Marshall on the American Military

At least two sets of events were set in motion in the years 1990 and 1991.

First, after Mr Marshall's 1990 request to Andrew Krepinevich to do an assessment of the Soviet writings on the military technical revolution, but before the assessment was released, the Office of Net Assessment sponsored a series of small discussions or seminars involving American military officers. Word of these seminars led General Gordon Sullivan, in the summer of 1991 while he was Chief of Staff of the United States Army, to approach Mr Marshall with an offer to 'go into business' with Marshall on how the Army should think about the future of war. Similarly, the Chief of Staff of the US Air Force, General Merrill 'Tony' McPeak offered to 'partner' with Mr Marshall on the military technical revolution.

Second, the First Gulf War took place in the first months of 1991 and the Soviet Union collapsed by the end of that year. Although the First Gulf War is properly understood as perhaps the last mass industrial war fought by the United States, it did include elements that featured what might be future modes of warfare. While there had been arguments about the efficacy of airpower against ground targets, Barry Watts, in his analysis done for the Gulf War Air Power Survey unambiguously highlighted how the character of air war was changing. He identified missions flown against ground targets in Iraq that were flown by F-111 bombers that dropped unguided munitions, and missions against comparable targets flown by F-111 bombers with laser designators dropping laser-guided munitions, and established that that latter bombers were able to destroy 13 times as many targets per airplane.

It is likely that the latter set of events led to the first set of events. Those events also probably helped Mr Marshall encourage the armed services to think about the implications of the military technical revolution for their future operations. Mr Marshall never stated what he thought the shape of future American military force structures or concepts of operation should be. He regarded this as, intellectually and morally, a decision that the services had to make for themselves. He did, however, wish to facilitate service efforts to think this issue through, and to that end, sponsored a series of seminars with the services. These began in Annapolis in 1992, when the senior leadership of all four military services assembled along with the senior figures from major American corporations that had experienced major transformations, including, for example, senior figures from American Telephone

and Telegraph (AT&T) that had experienced the break up of that monopoly into competitive 'Baby Bells'. These discussions were meant to help the American military think through how large organizations changed the core nature of their operations. This seminar was followed by other seminars with individual services.

Although the First Gulf War encouraged the services to take Mr Marshall's ideas seriously, that war, combined with the collapse of the Soviet Union, also seem to have led the services to the conclusion that while there might be a revolution in progress, they were already engaged in transforming themselves, and so needed to make no significant changes. At the 1992 Annapolis conference, the observer from AT&T listened to the American military leadership discuss what they planned to do, and then commented that they sounded like the AT&T management before the break up, when they did not realize the magnitude of the changes that were necessary. These managers, he commented, all had to be fired.

At a conference on the RMA done with the Air Force, one participant listened to the Air Force plans for technology acquisition and commented that these were impressive plans, but it sounded like the Air Force was staying in the same business: compiling lists of targets, and then dropping bombs on them. This, it was commented, was not a revolution.

Discussions with the US Marine Corps were initially more encouraging, as the Marines undertook a serious program of experimentation to explore new concepts of operations. This itself was a major change, since real experimentation was foreign to the military that used the initial utilization of equipment or concepts not as part of an effort to gain knowledge, but as part of a program to validate decisions that had already been made. Marine Corps experimentation did lead to a new concept of operations, 'Sea Dragon', which abandoned the core mission of the Marines, amphibious assault, in favor of operations that proceeded directly to the target far from the coastline. But this initial effort appears to have encountered serious opposition from within the Marine Corps. On one occasion, a briefing on 'Sea Dragon' elicited a comment from a general officer, 'when I asked you to think out of the box, I expected you to stay within sight of the box'.

The US Navy also began a strong effort to think about new concepts of operations, but that effort does not appear to have produced major transformations in the major sub-communities within the Navy.

The wargames that were sponsored by Mr Marshall also appear to indicate that his interest in the RMA as something that created fundamentally new modes of warfare in the United States was not widely shared. A survey of 'futures' wargames completed in 1998 showed that the ten games sponsored by Mr Marshall in the period

1994–97 featured large, technically capable adversaries, who attempted to use new capabilities to thwart older American power projection forces, and attacked the sources of information used by the United States to block American military objectives, while the American players investigated new ways of projecting power, from undersea and space, for example. The games sponsored by other agencies, however, investigated how to integrate reserve forces into American military operations, achieve mobility on the battlefield and use terrain, the importance of sociology for special force operations, urban warfare, and new systems such as rail guns. While space-based operations were discussed, new missions and concepts of operation received less attention.¹¹

If this assessment is correct, it could plausibly be argued that the First Gulf War both encouraged the services to discuss the ideas of Mr Marshall, but also deprived them of a motive to change themselves in non-incremental ways. The dissolution of the Soviet Union and the reductions in American military spending probably contributed to a tendency to defend existing missions, while the Second Gulf War and the war in Afghanistan led to an urgent focus on the problems related to those wars and to the problems of counterinsurgency, that took time and money away from the exploration of revolutionary change.

Bibliography

- Adamsky, Dima, *The Culture of Military Innovation: Comparing the Revolution in Military Affairs in Russia, the US and Israel* (Stanford UP 2010).
- Barrass, Gordon S., *The Great Cold War* (Stanford UP 2009).
- Gordon, Michael R. and Gen. Bernard E. Trainor, *The Generals' War* (Boston: Little Brown 1995).
- Hurley, William J., Dennis J. Gleeson, Stephen J. McNamara and Jeol B. Resnick, 'Summaries of Recent Futures War Games', *Joint Advanced Warfighting Program* (Institute for Defense Analysis, Alexandria, VA, Oct. 1998).
- Krepinevich, Andrew F., *The Military Technical Revolution: A Preliminary Assessment* (Washington DC: CSBA 2002).
- Rosen, Stephen Peter, 'Conventional Combat and the Nuclear Balance', *Journal of Strategic Studies* 10/1 (Spring 1987), 36–61.
- Stanley, Elizabeth A., *Evolutionary Technology in the Current Revolution in Military Affairs: The Army Tactical Command and Control System* (Carlisle, PA: Strategic Studies Institute/US Army War College, 1998).
- Watts, Barry D., *Six Decades of Guided Munitions and Battle Networks: Progress and Prospects* (Washington DC: CSBA 2007).

¹¹William J. Hurley, Dennis J. Gleeson, Stephen J. McNamara and Jeol B. Resnick, 'Summaries of Recent Futures War Games', *Joint Advanced Warfighting Program*, Institute for Defense Analysis, Alexandria, VA, Oct. 1998.