WARFARE IN THE 21st CENTURY

Doctrinal and technological concepts: How they might evolve and impact on the operational level of war in the next two decades.

Thesis: <<The evolution in both technology and doctrine in combination with the nature of future conflicts, will impact on the conduct of operations in the next two decades since neither the technology nor the doctrine alone can achieve victory>>.

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Introduction

In today's military reality, war is strongly dominated by the evolution of technology. The political and strategic demand for a quick victory with minimal casualties and assigned funds has rapidly increased the importance of technology in military operations. This technological evolution has impacted not only the battle itself but also doctrine. It is very interesting to follow technological evolution and its impact on doctrine throughout military history since neither the technology nor the doctrine alone can achieve victory. Actually, looking back in history we see the strong influence that technological evolution has had on doctrine, and specifically during the 20th century this influence inevitably expanded to the operational level of war. In the beginning of the 21st century we are in the forefront of evolutions in technology, which in combination with doctrine will strongly and rapidly impact on the conduct of war. As it is considered, future warfare will include asymmetric operations and low intensity conflicts against terrorists and rogue states, since there is no opponent capable successfully engaging the NATO Alliance.

At first, it is necessary to follow the technological evolution during the last centuries and its impact on doctrine (strategy, operational art, and tactics) up to today. The analysis will be extended to future warfare (conflict environment and, threats) and its impact on doctrine, which in combination with doctrine will apparently evolve to operational level of war. Additionally we should study how effective or ineffective thereof is technology and doctrine, during the last decades when strong and modern armies fought against small irregular troops. I will consider both symmetric and asymmetric warfare. Even

though we will likely face mainly asymmetric threats in the next two decades, it is always possible that we will be required to undertake low intensity operations against pariah states as well. Therefore, the impact of both the new conflict environment and technology on doctrine and conduct of future war are to be studied.

This essay concludes that the evolution in both technology and doctrine in combination with the nature of future conflicts will impact on the conduct of operations in the next two decades since neither the technology nor the doctrine alone can achieve victory.

Technology, warfare, and conflict environment.

Until the 15th century, the absence of serious technological progress did not allow any important changes in military matters. Both the army weaponry and tactics remained stable for centuries. The introduction of gunpowder (in the industry) presented sophisticated firearms, such as harquebus and cannons, which began to dominate the battlefield soon after 1500 AD. For the next two centuries the situation remained more or less stable, with small improvements in the military technology. The experience of wars pushed the various armies to examine each other's arms as they tried to stay abreast of developments.

As the technological competition intensified, after the first decade of the 18th century, it was determined by the military that no weapon or weapon system was decisive on its own. The other outstanding development was the shift from light, hand-held, individually operated devices, to heavy crew-operated ones. Therefore the long-term effect of gunpowder was to focus on crew-operated weapons, which dominated the field.

The first major result of the new weapons introduction in the battlefield was the decline of the cavalry and the infantry's stagnation. Napoleon believed that it was with artillery that war was made.[1]

Later, steam and internal combustion engines freed weapons from the limited power provided by horses, enabling their size, weight, and power to grow many times over. [2] Growth in the size of the army was inevitable since the heavy weaponry led to vast demands in organization, supply, maintenance, and repair.

On the other hand a new need appeared, connected with the technological insertion in the armies. Professional militaries were trained to serve the new weapons, to study the evolution in the tactics and to command and control. Furthermore well-organized, well-trained forces with properly functioning headquarters and a strong structure were necessary. So the more powerful and modern the weapons in use were, the more changes in all military sectors were needed. Therefore the human factor remained the vital tool in conducting military operations by introducing new doctrine and tactics. But even though new weapons and tactics appeared in the field during the first 50 years of the 19th century, the art of war, according to Napoleon, was a simple art. It was still the era of the heroic commander on horseback who was able to manage the battlefield. The term operational level was still unknown, and only tactics and strategy were known in the planning of military operations.

1,2. RUSI Journal Part I. High Technology and the Transformation of the War. Page 77. Martin Van Creveld.

Later on, during the second half of the 19th century, the German Field Marshal Von Moltke introduced the term operational. [3] Von Moltke's point of view was that strategy was a system of temporary methods, which had to be applied under different and continually changing circumstances. He also stated that studies and inquiries were more valuable to success than any doctrine. Presenting, in his book Ueber Strategy, his thinking about the relationship of Strategy, operations and tactics, he described ''the strategy as aimed to achieve the highest politically determined objective, the tactics as the way to break the enemy, and the operations as an equal and individual existence next to strategy and tactics''. The essential point of his operational thinking included a detailed deployment planning, seeking the destruction of the enemy's army as the operational objective, giving a maximum freedom of action to subordinates, and forming a center of effort to effect large envelopments and encirclements.

The introduction of the operational level in military planning was the result of the technological progress that affected the military matters. The technological advance that mostly influenced the military operations was the railway.[4] Using the railway it was possible to rapidly move numerous troops and supplies to distant destinations.

The next technological wave appeared during World War I, when the trend was toward military power that consisted less of men than of the machines that they operated. The trend towards bigger and more machines intensified during the war, and was accelerated further after 1918, leading to tank Blitzkrieg. It enabled the armed forces that

3. The operational Art: Developments in the Theories of War. Page 2. John English.
4. The operational Art: Developments in the Theories of War. Page 3. John English.

best knew how to employ it to overrun entire countries in short order. At the same time, it made them less suitable for fighting armed organizations except those resembling themselves.[5]

The military art, having at its disposal, an enormous variety of modern weaponry, succeeded to present a successful operational level of war, that was characterized by significant initiative at the formation level. Additionally, during the last part of World War II, the Allies forced by the nature of the large-scale operations against the Germans in Sicily and in Normandy, conducted for first time war at the operational level.

Apart from that, during the war, the Germans faced an unexpected new type of war. The partisans war. In response the Germans took drastic measures against anybody even remotely connected with the resistance, committing uncounted war-crimes and even genocide in the process. Although the suffering they inflicted was tremendous those measures failed. The partisans used guerilla and terrorist tactics to beat their significantly more powerful occupiers. The Germans were not ready to face such a kind of war. Their armies were not trained for a Low Intensity Conflict.

Two decades after the end of the WWII, the old colonial powers fought to keep their empires.[6] They deployed strong troops, compared with those of the insurgents who were seldom well armed. They employed the best available troops from the Special Air Service to the Foreign Legion. Their methods were drastic but in every case the outcome was failure.

5. RUSI Journal Part II. High Technology and the Transformation of the War. Page 61. Martin Van Creveld.
6. RUSI Journal Part II. High Technology and the Transformation of the War. Page 61. Martin Van Creveld.

Next it was the turn of the two superpowers to show that they could prevail over low intensity conflict. They too, used their best troops. Operating on a scale far beyond the capability of anyone else, they backed up those forces with spectacular arrays of the most powerful, modern, weapons ever. Yet they too ended up by withdrawing from Vietnam and Afghanistan respectively. Why did they fail?

Their command, control, communications and information structures were designed for fighting each other so they were incapable of doing anything else. Their standing operations procedures were intended to co-ordinate many different types of heavy, complicated weapons, which tended to be too complex and too slow to deal with agile guerillas.

Additionally, even though the Americans had the world's best technology, the Vietnamese won the war through organizational and operational concepts better suited to their culture, climate, and geography.

The Soviets suffered their own disaster in Afghanistan once the technologically inferior guerrillas gained confidence and a degree of parity through the introduction of the Stinger missile.

The human factor once again emerged as the key element in defeating modern armies by rapidly adapting and applying irregular tactics to the modern battlefield and a technologically superior enemy.

Focusing on military technology, again the main reason why modern weapons are so often useless in Low Intensity Conflict is because they are designed to face symmetrical threats.[7] The more advanced, powerful, and fast-moving they are, the more they

7. RUSI Journal Part I. High Technology and the Transformation of the War. Page 63. Martin Van Creveld.

depend on electronic instruments for acquiring, tracking, and hitting targets. The effectiveness of electronic sensors, however, is determined by the complexity of the environment in which they operate. They tend to work best in outer space, where there are only a few simple objects flying around and where there is nothing to fight over.[8] The most complicated environments (consisting of people, their dwellings, their means of production, their roads, and their vehicles) are the most difficult. Electronic sensors and the computers to which they are hooked cannot yet match the human brain in flexibility and inventiveness. They find it very hard to tell friend from enemy, real targets from decoys, worthwhile objectives from every kind of clutter. They can also be jammed, overloaded, or spoofed, often by cheap devices readily available on the open market. Thus the advent since 1945 of powerful, electronically guided weapons led to a dialectical reaction. [9]

As of now, the future of conventional war, with the eventual involvement of regular state owned armed forces, appears bleak. Wherever one looks the largest military powers are disarming. The advanced crew-operated expensive weapon systems that until very recently formed the pride and joy of armed forces are being scrapped; third or fourth rate powers still hope to use them or are afraid that they may be used against them.
But even though conventional war appears not very possible, there is always possibility to fight against a rogue state that hosts terrorists.

It is obvious that the kind of the armed conflicts which NATO will possibly face for

8. RUSI Journal Part I. High Technology and the Transformation of the War. Page 63. Martin Van Creveld.
9. RUSI Journal Part I. High Technology and the Transformation of the War. Page 63. Martin Van Creveld.

groups. Those states or groups will be equipped with small quantities of modern mass destruction weapons, and sometimes the theater will not be clearly determined. The next two decades, are low intensity conflicts against rogue states or against terrorist conflict environment will include mostly urban or mountainous areas. The tragedy that happened in New York on September 11, 2001 shows that unexpected methods can be used everywhere, and that sensitive areas, like the homeland and the zone of communications, can be targeted. The security of our installations and our homeland require more sophisticated surveillance equipment.

Thus, the main task of future technology will be to help distinguish friend from foe and to check persons and their belongings.[10] Instead of tanks and cannon there will be bomb-detection and disposal devices. Instead of radars, head-up displays, forward looking infra-reds, and mission computers, there will be listening devices, surveillance cameras, night vision equipment, and tamper-proof magnetic identity cards. Technology, in short, will focus less on defending against an external threat by regular forces and more on providing security against an internal one. Its enemies will be guerillas and terrorists, who in turn will often be indistinguishable from ordinary criminals, and indeed the shift is taking place right now. The technology of surveillance and espionage can help in low intensity conflict as well.

But as history proves, if one side can erect fences then the other can think of ways to cross them. If one side can build improved bomb-detecting machines then, the other can

10. RUSI Journal Part I. High Technology and the Transformation of the War. Page 64. Martin Van Creveld.

probably come up with explosives whose signature is reduced. If one side can build decoding apparatus, then the other will come up with better scramblers. Devices declared tamper-proof by their manufactures will be probably tampered with. Apparatus guaranteed always to sound the alarm will either be subject to occasional failure or else give the wrong signal at the wrong time for the wrong reasons. The more perfect and ubiquitous the technology, the greater the workload needed to watch everybody all the time. Time will cause the best-motivated personnel in the world to become lax and inattentive; they may also be outwitted, bribed, or subverted.

Even though technology will evolve in future conflicts by offering numerous electronic devices valuable for surveillan

complex and widely ranging environments against industrial-age enemies as well as asymmetric opponents who use a combination of kinetic and invisible, digital methods to compete.

The Internet might be used by the opponents to learn, orchestrate and coordinate at the speed of light.[11] Additionally, our future enemies will use the Internet to empower small groups and individuals around the world to the point where time and distance become irrelevant. They will engage our forces in invisible struggles to affect decisions, and find and strike weaknesses, no matter where, of the technologically advantaged.

The opponent will seek ways to manipulate commander's trust in the veracity of data, information and knowledge. They will try to disrupt just-in-time logistics by attacking knowledge workers, disrupting the time phased force deployment synchronization, affecting the operations of lines of communications, aerial ports and seaports of debarkation. Our future asymmetric opponent will attempt to affect precision fires by disrupting or manipulating data streams from collectors, jamming up and downlinks, attacking mission ground stations, and conducting sophisticated denial and deception operations.[12] They will also attempt to manipulate the will of our population by creating large numbers of casualties, both civilian and military. Their doctrine will include, very often, limited objectives that relate to large objectives, with plans for enacting larger goals over several years.[13]

11. The Janus Paradox: The Land Warfare Papers. No 26 Oct 2000. Page 1. Wayne M. Hall.

12. The Janus Paradox: The Land Warfare Papers. No 26 Oct 2000. Page 3. Wayne M. Hall.

13. The Janus Paradox: The Land Warfare Papers. No 26 Oct 2000. Page 4. Wayne M. Hall.

Therefore, the future conflicts will be characterized by an enormous complexity and variety and will mostly require joint, small size formations with the ability to conduct various deep operations in hostile environments. They must also possess the flexibility and means to confront an enemy with a variety of capabilities from all dimensions of combat: air, sea, land, and space. Deployment bases, which might include installations and logistics, will be required for fast troop deployment and sustainment of operations.

The theater will be a small area or a state far away from our homeland.[14] It will probably include mountains and forests and hostile troops deployed in small units, aimed to control key positions, and to fight using sophisticated weaponry and irregular tactics and strategy. Urban environments may also serve as preferable battlefields for the future enemy. Most places, in which military operations will occur, will have weak infrastructures. That is, there will be minimum communications infrastructure, limited fiber-optic cable, limited port and air facilities, poor distribution and transportation systems and limited power grids. These shortfalls will constrain our forces and cause us to make substantial adjustments in concepts of operations and activities in the objective area. [15]

Transitional states located in Europe, the Middle East, Caucasus and Asia have already begun to develop the needed economy to support more modern armies. However these states may face the challenge of threatening neighboring regions; the stability thereof is our concern. NATO forces are not prepared to undertake operations in such regions to oppose the potential threat of terrorism and intensity conflict.

14. The Janus Paradox: The Land Warfare Papers. No 26 Oct 2000. Page 5. Wayne M. Hall.
15. The Janus Paradox: The Land Warfare Papers. No 26 Oct 2000. Page 6. Wayne M. Hall.

In attempting to establish the total impact of the new conflict environment in combination with the technological impact on the doctrine and their extension to the conduct of war at the operational level, we can say that: in the case of an asymmetric warfare, there is no place for strategy, but only for operational doctrine since the commander of a joint small size army will likely undertake the mission to extinguish the threat by a special operation. Therefore, the new doctrine will be focused mainly on the operational level of war.
The objective, in the case of an asymmetric warfare, might be considered the same for both the strategic and operational level. As a future special operation we can imagine a Joint Small Size Campaign against a terrorist group or small rogue state in order to destroy military installations, weapons of mass destruction, and to arrest terrorists (Afghanistan).

The new challenges led the thinking to the Revolution in Military Affairs and forced the military to change its vision and doctrine. Joint Vision 2020 extols as its pillars just-in-time logistics, dominant maneuver, full protection and precision engagement.[16] The vision also says information superiority is the principal enhancer of the vision.[17] The information must be tailorable, since each situation will require different information in terms of timeliness, specificity, accuracy and relevancy. It must also be adaptable in the environment of operations, and adjustable, as the commanders need clear information to make quick and good decisions.

16. The Janus Paradox: The Land Warfare Papers. No 26 Oct 2000. Page 7. Wayne M. Hall.
17. The Janus Paradox: The Land Warfare Papers. No 26 Oct 2000. Page 7. Wayne M. Hall.

Furthermore, some new constraints such as social, economic, political (casualties and collateral damages) and ecological will make any operation very complex.[18] As roles and missions merge among departments, organizations and agencies, constitutional guidance, legal mandates and laws will become constraints.

Following the discussion above on technology and the future conflict I will now present some thoughts in connection with doctrine and its impact on the operational conduct of war will be discussed.

The first sign of the future of conflict came with planning for operations that might be launched against Afghanistan. The possible theater will include urban and mountainous areas in which the enemy will operate having low technology equipment and using mainly irregular tactics such as terrorist attacks against troops. We expect special operations, at the operational level of war, by joint troops trying to achieve a number of operational objectives. The new technology will seriously enhance the operations by offering extremely sophisticated means for supervising the theater, and for commanding and controlling troops.

One more indication that gives us a picture about the future technological impact on the operational level of war is the "system of systems''[19] proposed by Admiral Owens. The system of systems foresees a large, defined battle-space, which the commander would dominate through superior situational awareness, information warfare, space control, highly responsive command and control structures, dominant maneuver,

18. The Janus Paradox: The Land Warfare Papers. No 26 Oct 2000. Page 9. Wayne M. Hall.
19. Revolution in Warfare Foreign Affairs. Vol 75. No 2. Page 38. Eliot Kohen.

and a wide array of precision strike systems. As we can understand, it will probably drive to less initiative at the operational level of war.

The challenge that will arise either for the NATO Headquarter or the US Joint Staff is to avoid any intervention while they would follow the conduct of military operations in the very low level of command, throughout an extremely capable command and control system.

From another point of view technology, today, imposes a kind of tyranny on military matters. Its evolution is extremely fast by producing numerous sophisticated systems, which deprive the planners of the time to follow the technological evolution. Misunderstanding will not help the planners to achieve a military development. Very often they are driven towards utilizing evolutionary approaches in trying to stimulate a new military revolution.

There is no doubt that we are at the start of a new military revolution, which is going to be led by informatics, computers, and communications. In response the competitors will, certainly, try to defeat that approach through less costly, but dangerous developments, such as biological warfare.

As we can conclude the goal of doctrine, will be in future as in the past, to provide suggestions for how to best achieve the objective by winning quickly, decisively and at the lowest cost in lives and money.

Lastly, the impact of technology on the operational level of war in the next two decades must be examined, by taking into consideration the experience gained during the Gulf War and the nature of the future conflict. To do that, is necessary to follow an analytical method by examining all the fundamental elements of the operation level of

war, as they are described in the American Joint Pub 3-0.[20] Even though the likelihood of symmetric warfare is considered unlikely in the near term, it is important to examine its impact on the conduct of future operations since rogue states remain a threat to peace and traditional military responses may be required. Furthermore, fundamental elements of the operational level of war will be taken into consideration during both the operational planning and execution of operations in asymmetric warfare.

Synergy: Can be defined as to employ air, land, sea, space, and special operations in a wide variety of operations in war and other than war. When required to employ force, the JFC should seek combinations of forces and actions to achieve concentration in various dimensions, all achieving the ASSIGNED objectives in the shortest time possible and with the MINIMAL casualties.

As we can see there is an aim for minimal casualties and also it is not clear who will define the objectives. The technology (mass-media presence), a real challenge for the politicians and the campaigns, obliges the armies to sacrifice the initiative by imposing assigned objectives and depriving them the choice of risk. This dynamic has been seen during the Gulf War.

Simultaneity and Depth [21] are the key characteristics that contribute directly to the enemy's collapse. These elements also require an appropriate attack on enemy forces and function in such a manner as to cause confusion and demoralization.

The desired level of synchronization and the depth of the theater both require high technology command and control system and perfect communications. The advances in

20. Pub. 3-0. Doctrine for Joint Operations. Page III9. US Army.
21. Pub. 3-0. Doctrine for Joint Operations. Page III11. US Army.

technology have expanded the depth of operations. In the future we expect that the theater will include space since the enemy will probably have under his disposition satellite systems such as communications and surveillance systems. The technological evolution will necessarily dominate on the simultaneity and depth.

Anticipation is an essential factor for effective planning. It protects the operation from unexpected events. The decision makers will need more and more information about the enemy's capabilities, potential and intentions, which require sophisticated technological means for spying in hostile areas.

Balance is one more interesting fundamental element, which is aiming to maintain the force, its capabilities and its operations in such a manner as to contribute to freedom of action and responsiveness. The challenge is to disrupt the enemy's balance by deception, manipulation of the electromagnetic spectrum, and special operations. At the same time we must deny the enemy's reconnaissance, intelligence, surveillance and target acquisition. So the need for improved technological means is imperative.

Leverage[22] has been considered as the centerpiece of the joint operational level of war since its purpose is to gain, maintain, and exploit advantages in combat power across all dimensions. Arrangement of various symmetrical and asymmetrical actions against the enemy's forces can provide a decisive advantage. Domination of the information and communication sectors is required.

22. Pub. 3-0. Doctrine for Joint Operations. Page III14. US Army.

Centers of Gravity will face a new challenge since Information Centers of Gravity will be a new addition in order to enhance friendly decision cycles while degrading the opponents.

For the other fundamental elements such as Timing and Tempo, Operational Reach and Approach, Forces and Functions, Arranging Operations, Direct versus Indirect, Decisive Points, and Culmination, we can assess that all of them require superiority in technology, to facilitate the planning and campaigning.[23] Deep operations and dominant maneuver in combination with the operation environment will also impact the conduct of operations.

The modern demands for a fast and decisive victory which can be achieved only by well conceived operational planning and well equipped armies conducting operations under capable command, as well as troops that will operate far from the homeland, all require high technology and a doctrine adapted to the particularities of both a threat and conflict environment.

Technology and doctrine.

As the US Army defines it, doctrine is: Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives.[24] The study of strategy, operational art, and tactics provide more details about doctrine.

23. Pub. 3-0. Doctrine for Joint Operations. Page III 22. US Army.
24. Parameters 2000: The effect of Doctrine on the Behavior of Armies. Page 30. Paul Johnston.

These three aspects met a lot of challenges in theory and in the field during the last two centuries, since the technological evolution in military equipment enlarged the planning and campaigning capabilities.

The term “operational level’’ refers to an intermediate phenomenon that exists between tactics and strategy. The term ‘’operational art’’ refers to the practice of the staff for achieving operational success. In the period between 1850 and World War I,[25] the German General Staff further developed the concept of operational art.

Later on and after the World War I, the Soviets introduced the concept of the operational art as a new category of the military theory. According to Soviet military theory, operational art is one of the three components of the military art that connects the strategy and the tactics.

Focusing on the gradual development of military art of the Soviet armies we see a remarkable evolution of technology and its impact on the operational level of war.

On the other side, with the western allies apparently having different strategies and army organization and size, they did not realize the importance of the operational level of war. Only after the Vietnam War did they realize that the army’s technology and size are not sufficient for victory. So it was time to start thinking about doctrine.

The serious concern of the Americans was that troop performance, though tactical, might prove futile in the event of faulty strategy and grand tactics. One more American concern was their ability to fight outnumbered, and still emerge victorious in a major European Land Campaign.

25. The operational Art: Developments in the Theories of War. Page 8. M.A.Henessy and B.J.Kercher

The US Army solved the question of maneuver or attrition in 1980 in the rewritten FM 100-5 with an enthusiastic adoption of maneuver. This was a turning point for the US Army since the Americans were very much attached to the idea that fighting depended on firepower and material superiority.

In 1991, during the Gulf War, the US Army tried to apply its latest development in doctrine. Maneuver. Some authors[26] have seen this war as an evolutionary application of the post-Cold War doctrine and technology that in a way repeats the German Blitzkrieg but faster. But according to others[27] the Gulf War was a manifestation of a concept developed by the Soviets: a modern military revolution built around a reconnaissance-strike system structured for rapid victory on a dense, deep armored battlefield. Unfortunately this was impossible because of the following reasons.

The doctrine was to win quickly, decisively, and at the least possible cost. The challenge was to expel Iraq from Kuwait and the tactical requirements called for precise attacks by air, land, and sea forces against such targets as command bunkers, radars, air defense headquarters, airfields, electrical power grids, bridges, and capabilities associated with weapons of mass destruction, while keeping collateral damage to the civilian population and historical and cultural features as low as possible. Space-based capabilities such as global positioning, ballistic missile launch warning, weather and communications satellites; precision-guided munitions; stealth aircraft and low-observable cruise missiles; secure communication systems; and networked computers all

26,27. Strategic Review, Fall 1996 : Force Planning, Military Revolutions and the Tyranny of Technology. Page 32. Henry Bartlett, Paul Holman, Timothy Somes.

played crucial roles. These changes in technology and organization permitted a very ambitious concept of operations: a comprehensive, near-simultaneous, theater-wide offensive. The coalition possessed informational dominance, giving commanders significant near-real time knowledge while blinding the adversary.

But those technological means, (modern communications and command and control system), and the imperative to avoid huge casualties drove the operations to a centralized command and control system. On the other hand the objectives [28] were neither strategic (Baghdad) nor operational (Nasiriyah or the destruction of the Republican Guard) which were both centers of gravity.

The next conflict that offered an experience and at the same times some indication of the future enemy's nature was the Kosovo campaign. The Alliance, focusing on political goals, tried to achieve the political objective by air operations. The objective was to force Milosevic, by means of destroying his military machine, to accept the terms imposed by the Alliance. The objective, to destroy the enemy's military machine, was not achieved since only 15% of FRY tanks and anti-aircraft systems were destroyed. Finally, Milosevic accepted the NATO terms but his military machine was still intact. Since no further details are widely known about the campaign plan, we cannot speak about the operational objectives. So, technology and weapon superiority appeared to offer victory without wars such as we know up to now.

Taking into consideration the lessons learned from the Gulf War, the Kosovo Campaign, and the asymmetric threat recently used against the

28. Parameters 2000: Doctrine is not Enough: The effect of Doctrine on the Behavior of Armies. Page 30. Paul Johnston.

western countries; we can easily determine the impact of technology on future doctrine. Conduct of war on the operational level dominated by operational objective aims might be expected. Information may represent a new Center of Gravity and must be considered in the conflict environment, Maneuver, and Deep Operations.

Conclusions

The military art was stable for centuries due to a lack of technological evolution. Strategy and tactics were the only elements of doctrine. Technological evolution, by introducing new inventions, new weaponry and transportation means, offered the potential for further development in both the doctrine and the army structure, which gradually presented the operational art as its element. Technology was inevitably the essential means for any kind of development in military matters.

Since neither technology nor doctrine alone can achieve victory, whenever military operations improved only one of these elements, the only result was failure. The lesson learned from the German Blitzkrieg and the Soviet operations in the beginning of World War II, is that only the combination of both the doctrine and the technology adapted to special circumstances can achieve victory. The Soviets, after having combined the evolution in their doctrine with the modern weaponry, finally succeeded in winning the war.

The new conflict environment will present one more kind of challenging war in which strong modern armies equipped by extremely sophisticated weaponry and means will conduct operations against a weak enemy, which will have at its disposal a small

number of weapons of mass destruction. The threat can be foreseen as asymmetric and the conflict environment will include urban territory, possibly mountainous areas, or both. The possible absence of a strategic goal in combination with the size and structure of the operating armies will possibly open the road for evolutionary changes in the doctrine by focusing mainly on the operational level of war. But no one can accept that conventional war is outdated, since there is always possibility for NATO Alliance to undertake operations against a rogue state that hosts terrorists or represent a threat against the stability in its region.

A kind of experience about the rapid evolution introduced by technology can be seen in the Gulf War. There, a modern powerful military machine conducted conventional o7Tj4technology wy leapoequippTdaion. The thi

include asymmetric threats and nontraditional environmental variables that could influence the operations. In such a conflict, deep operations, just-in-time logistics and synchronization, information centers of gravity and dominant maneuvers, will be taken into serious consideration.

High technology and a supporting doctrine that have been adapted to the emerging threat and conflict environment are an absolute requirement for the conduct of asymmetric warfare. It is necessary to keep in mind that technology alone is nothing more than a tool for improving the capabilities of the fighting forces. The human factor will always be a critical improving to doctrine and tactics to enhance the capability of every soldier in conducting military operations.

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