

TRANSFORMATION OF THE MILITARY SPHERE OF ARMENIA AND THE IMPERATIVES OF THE NEW AGE

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Discussed here are the theoretical aspects of Armenia's Military Sphere and its transformation to be performed on the basis of the Armenian vision of war as well as using the advanced military thought and organizational experience of other nations. Conceptually this transformation is leaning upon the paradigm of non-linearity and the theory of complex adaptive systems constituting the basic principles of the new concepts of warfare, such as the network-centric warfare and effects-based operations.

The human factor is a crucial element of new concepts, so that any transformation of the Military Sphere is to be based upon admitting the complex and human-centric nature of war, thus suggesting the indispensable modification of the military culture. Transformation turns out to be a complex dynamic process, its success being in many ways contingent upon the capability to discover the equilibrium between the creative power, access to innovations, and an inevitable inertia of the military establishment.

Introduction

The processes of globalization modify the geopolitical landscape and the International security environment, inducing the nations and countries to respond to the new threats and challenges. Through qualitative changes the world of the 21st century has become more complex, harboring multiple asymmetric threats, which can hardly be countered by using the institutions and concepts of the industrial age. There is an emerging insistent need to review the traditional models of conflict and warfare, while elaborating the new ones describing the war continuum of the 21st century. The currently applied techniques and assessments of the perils and threats yielding qualitative evaluations in forming the military establishment turn out to be inefficient or inadequate to the newly emerging global environment.

To generate an adequate response to the challenges of the new epoch, the society, state and its military establishment have to be transformed, thus, transformation of Armenia's military domain¹ is a dire necessity. To conform to the new epoch, its challenges and threats, Armenia has to initiate the military reforms, leaning upon the achievements of military thought and the organizational experience of other states and armies. Attempts of directly copying alien schemes and concepts are doomed to failure all along, since they never leave chances to catch up with the rapidly changing world. The transformation of Armenia's Military Sphere should take place on the basis of the Armenian military logic and the visualization of war leaning upon the potential capabilities of the Armenian world.

The outside imperatives of transformation turn out to be complemented by the inside ones. The Armed Forces of Armenia have marched into the 21st century with a status of the most combat worthy ones in South Caucasus. The objective of retaining this status is a crucial condition for retaining the balance of power that has taken shape in the region. Its implementation cannot be achieved through building up the military potential only, but rather by a qualitative leap supported by a relevant theoretical basis. The Armenian Army should make a leap to the armed forces of the 21st century. It is a complex task suggesting the initiation of the two apparently mutually exclusive processes: retention of parity and balance within the region, with simultaneous qualitative changes in Armenia's military establishment. Unverified steps or ill-conceived reforms may produce fatal effects upon the reborn Armenian statehood. Rejection of reforms or qualitative changes, on the other hand, may also after some time result in a changed power balance in the region. In actual fact, Armenia is confronted with a dilemma of either qualitative reforms and a military revolution or unavoidable concessions.

Perceiving the need for transformation of Armenia's Military Sphere and its theoretical development necessitates an analysis to be made of the experience of other countries making a leap to the armed forces of the 21st century. The concepts of such transformations are leaning upon the paradigm of nonlinearity and the theory of complex adaptive systems constituting a base for developing the new concepts of war, such as the network-centric wars (NCW) and the effects-based operations (EBO).

The crucial element of such new concepts is not only the technologies, but rather the human factor, so that any revolution in the military affairs and a transformation of the Military Sphere should start from admitting the complex and human-centric nature of war. That in turn will require inevitable changes in

¹ Here and onwards "Armenia" is understood as two Armenian states: Republic of Armenia and Republic of Nagorno-Kharabakh, which are two constituents of the cultural and military-strategic space.

military culture including in particular the military education, the system of training and skill enhancement for military personnel, etc.

Transformation thus is starting and terminating within the culture, being reflected in the society's system of values and in the behavior of its members. What the nation believes, what it can visualize as its future, will definitely have an effect upon the transformation which turns out to be a complex and self-changing dynamic process largely depending on its success upon the society's capability to find a balance between creativity, readiness for innovations, and the inevitable inertial continuity of the military establishment.

1. Globalization and a Variable Security Environment in the 21st Century

1.1. Globalization

The depth of globalization processes, having embraced the entire world, and proceeding painfully at times, prevents their consideration as exclusively technological or economic phenomena. Globalization includes the social and political aspects concerning to some degree not only the social or political structures of society, but an individual personality. Although the involvement of a specific society in globalization processes can be subject of discussion, globalization itself is beyond any doubt. Moreover, many symptoms indicate that the radical change of the West, having initiated the current globalization, results in modifying the Western identity itself, thus necessarily modifying our perceptions of the personality, social medium and the state [64, pp.2-12]. The indications are that the said processes have somehow slipped out of control by the society, evidently overgrowing the state's ability to control them. Globalization is more and more resembling a self-sufficient process with its inherent logical and dynamic processes not subject to control or guiding. It is rather reversely, the globalization processes push the states, the state economies and the society, to integral variations and adaptation to the continuously varying world.

One may be tempted to present the globalization processes as resulting from conscious task-oriented activities by the West implementing a certain large-scale project [53, pp. 4-5]. This approach can also be observed in the West, rather than only in the third-world Islamic countries. Historian Tony Judt wrote in his book "After the War" on the post-war Europe:

"Europe's emergence in the dawn of the 21st century as a paragon of the

international virtues: a community of values . . . held up by Europeans and non-Europeans alike as an exemplar for all to emulate¹ [28]». This reputation is incidentally, according to Judt, well deserved. A similar world vision is characteristic of the British new laborites. In his manifest “Why will Europe control the 21st century”² [37] Mark Leonard wrote: “What I am asking you to imagine is the “New European Century”... Europe represents a synthesis of the energy and freedom that come from liberalism with the stability and welfare that come from social democracy. As the world becomes richer and moves beyond satisfying basic needs such as hunger and health, the European way of life will become irresistible”. And further on, “As India, Brazil, South Africa and even China develop economically and express themselves politically, the European model will represent an irresistibly attractive way of enhancing their prosperity whilst protecting their security. They will join with the EU in building “a New European Century.”

The reality, however, looks differently. Had we been confronted with a conscious activity and a project, then both the incentives of the globalization processes and their counterincentives could have been presented as simpler objectives. In actual fact we deal with processes having their own logic, supported directly by the society and by the new technologies creating the new reality, which has to be reckoned with by the political domain, as well as by other traditional components of power as well as by the social medium as a whole [53, p. 5].

Having originated and become self-sufficient, globalization results in rapid development of the economic sphere, with an ensuing complication of state regulation and the politics, affecting in turn the economic and social spheres. The society of the 21st century can be presented as a system with multiple feedback connections and a direct link to the economic sphere, rather than to politics or, all the less so, to ideology. The latter are trying to regulate, rather than to initiate the processes being deployed. The society-controlling processes and those regulating the public life and economy based upon the hierarchy and its traditional mechanisms turn out to be among those trailing behind, trying to overtake the continuously escaping globalization.

One can presently clearly identify the processes of globalization and their two vectors of development. The first one is associated with the real emergence of information communities, related to the globalization of the third wave [56] and the second; it is an implacable change of the traditional social systems and societies [49, pp. 145-169]. Although the first phenomenon is related to the developed

¹ Quoted after [72], original article [3].

² Quoted after [72], original article [3].

countries only, the second one has embraced the whole globe. The effect of globalization processes on culture has resulted in the new phenomenon, the mass culture, also resulting from the development of electronic media and cultural processes, rather than from the development of ideology [73, pp. 123-153].

The aggressive intrusion of the globalization into traditional societies cannot but produce a response on a wide scale. Some societies and cultures, like those of Japan, China, and India are being adapted, forming an adequate response to the challenges of globalization. Others, unable to stem the onslaught, are broken, and, gradually dissolving, are assimilated to the new global world, losing their originality. Some cultures take the road of counteracting globalization, reverting to specific forms of destructive response. The Islamic world and Islamic terrorism, the way it emerged in the 21st century, is a manifestation of such a response and problems, to be developed in the global world to come¹.

The new threats to the global world currently being generated and to the currently existing political system can also proceed from communities, social groups and persons consciously or unconsciously disconnected from the globalization processes [11, p.1]. The examples of North Korea and Afghanistan show the isolation or self-isolation of a specific society to eventually end up in a crisis. The ever growing rate of the world development results in the community being disconnected from globalization processes and its inevitable retardation. The gap is only increasing with time, making the recuperation a singular and painful problem.

The paradox of globalization is that by integrating the world and making it open and transparent, it provides individual social groups and persons with practically unlimited capabilities to affect it. The social groups today can be transnational and even virtual, supporting their identity through the Network. The greatest challenge is carried by the communities remaining local in their value criteria, while being integrated into the world community and enjoying its privileges [65].

Openness carries new sophisticated threats, turning out to be beyond the traditional systems of security. The existing techniques and metrics for appraising the threats and perils, enabling qualitative approximations to be made of specific measures, are becoming inadequate to the emerging global environment of the 21st century.

¹ E.g., Albert Hourani gave descriptions of the economic, religious and cultural responses by the Arab world upon the invading Western culture. He quotes Sayyid Qutb who called for Jihad as far back as 1964 “not only for defense, but for destroying the false gods and removing all hurdles hindering people to adopt Islam [26, pp. 445-446].

1.2. Cyberspace and the New Security Environment

Alfred Thayer Mahan in his day defined the open sea providing the International trade and communications as “a wide common” [47, pp. 5-46]. Nations and states were striving to gain or improve access to the sea, since this factor was the base of the society’s competitive ability, creating the premises for obtaining regional or global advantages. In many ways access to the sea and to International trade routes was becoming a necessary condition for the country’s successful development, while by obstructing this access or controlling it the world power centers used to resolve the problem of power balance on world-wide or regional scales. The control of this domain was tantamount to the mastery of the sea¹. Mahan could not foresee the air and space communications, however he would perhaps not object to his concepts being extended to aerospace².

The 21st century displays the generation of the new environment and the cyberspace tending to partially or fully assume the functions having belonged to the sea for many centuries.

We deal here not just with the Internet or with the national and global data structures. The new medium includes the domains of data and cognition leaning upon the entire mass media and financial media [11, pp. 7-8]. The new space has many common things with its predecessor; it has already become an International domain of trade and communication, exerting an influence on the country’s status within the world power hierarchy. Boosting the country’s status in cyberspace will increase the specific gravity of traditional elements of national power: diplomacy, the military and economic spheres. Cyberspace has been firmly established in the list of basic items of national power³.

The new medium however has significant distinctions. In the first place, it is the price of access, which is far below that of the access to the sea. Besides, the cyberspace is in many ways controlled by corporations, institutions and even individuals, rather than by states or nations. Moreover, while the sea and air spaces are determined and limited by a relevant physical medium, cyberspace is non-dimensional and expanding in geometrical progression, this growth being little associated with whatever physical limitations. And, finally, an inherent part of the new medium is the human personality carrying the creative principle and the cultural component described using the terms DATA, PERCEPTION, COGNI-

¹ The term “Command of the sea” was introduced by Paul Kennedy in the work [30].

² For discussion on this issue see [47].

³ The US contemporary military doctrine makes a distinction of four categories of power controlled by a nation: diplomatic, informational, military and economic (DIME). Until recently use was made of the social/psychological power and political power, which are now joined to the informational and diplomatic, which does not seem to be quite right. See [6, p. 84].

TION, FAITH, etc. Cyberspace is thus becoming a complex operational environment qualitatively different from the predecessors [11, p.8].

The struggle for the 21st century and for the future is being deployed upon the continuously varying landscape of the global world, with the various challenges of security ruling out the simple solutions. To remain adequate, we have to not only examine the nature of the current variations, but what is far more important, to admit that the rate of these changes is going up and there is no global force or center of power that can control or guide them.

The emergence of the new medium modifying the terms of competition, is bound to affect the political sphere having similar features. The link of the nation's political victory with the applied effort is not direct, and cannot be expressed in physical terms and evaluations. In the same way a political gain or setback affect the society integrally, achievements or losses in cyberspace will also affect the elements of national power and the whole society. Evidently, cyberspace does not cancel the conflicts in traditional spheres, but it can and does affect the efficiency of a specific struggle, thus also affecting the terms of achieving the political victory in the 21st century. Which means that the security environment in the 21st century has a complex quality requiring interpretation?

The changes of security environment could not fail to impact the war and conflicts being the immanent properties of this world and the patterns of behavior which have been observed throughout the human history. And while the nature of war remains fundamentally unchanged, it cannot be said about its character. War is both a political action and a social institute, and its character and forms are subject to change with changing time, communities, political systems, or technologies¹.

In order to stay adequate, the 21st-century Armed forces have to be adapted to the new terms, although undoubtedly the decisions associated with the globalization processes lie in the first place, in the political, social, and economic spheres, rather than in the military one². Globalization changes the geopolitical landscape and the security environment, compelling the nations to clarify themselves on what should be their military capabilities, that would enable them to tackle both the old and new challenges. These military capabilities will have to provide the political use of the military instruments on a widerer scale than before [11, p. 9]. The armed forces of today have to achieve objectives previously unrelated to the competence of the army or the military.

The multiple links permeating the modern global world render inadequate

¹ The problem of interrelations between the nature and forms of warfare is touched upon in [74, pp. 109-149].

² This understanding is not quite new, see [70. p. 15].

the traditional approaches to the construction of armed forces and the state military establishments oriented to the state actors and the security systems of the 20th century. A contribution to the security environment of the 21st century is offered by the new elements: non-governmental actors, failed states, the International terrorist network, criminal organizations, etc., for which the ideological, cultural, political and other boundaries of the 20th century are porous and transparent [65]. Under the new terms the military force cannot be considered exclusively in the terms of interstate war and even less so as large-scale military operations.

Another aspect of the problem is that unformulated new approaches to the role of armed forces in the 21st century do not cancel their effect upon the emerging security environment. The various military activities will interact with the emerging environment anyway, which environment is plastic and subject to variations. Meanwhile, inactivity may paradoxically affect both the situation and the environment as a whole, producing effects that can exceed any action. A classical example of such inactivity is the Munich deal of 1938 and the decision by Britain and France to deny aid to Czechoslovakia [54, p.3].

Under these conditions the multitude of well developed and formalized instruments of the industrial age, the classical armed forces and the military establishments of states turn out to be inadequate to the new strategic context. Since the changes are qualitative, the military establishment cannot be aligned with them through whatever quantitative changes dealing with only the military component of national security. Since the security environment is complex and varying, there can hardly be a complete knowledge and awareness of all challenges and threats, their multiplicity will prompt an introduction of some classification, to mark the priorities and to balance the risks. In the first approximation, the challenges and threats can be divided into the traditional, irregular, the destructive, and the disastrous [11, p.2].

The new security environment yields the following determinant characteristics of military activities:

- multidimensional military operations and campaigns like those in Afghanistan and Iraq are becoming normality, rather than an aberration.
- Both the actors and the interactions can have global and local characters, can be symmetrical or asymmetrical, governmental or non-governmental;
- The interactions are impossible to divide or classify with the identification of the political, military, social or economic component.

The multidimensional military operations of the 21st century are perceived differently by a wide range of observers, from allies to adversaries, and there is no

way of telling, which aspect is critical. Moreover, it is the interaction of different factors that is oftentimes becoming critical both within the duration of the military campaign and in its results [54, p.3].

The new security environment is setting two apparently controversial tasks before the Armenian statehood, to be resolved in parallel. On the one hand, Armenia must continue the construction and consolidation of the state power, while being aware of the need for a qualitative leap, transformation and transition to the paradigm of the 21st century, to be effected against the background of ever accelerating globalization processes shortening the cycles of decision making.

The rate and scale of the current changes compel the state military establishment to become more flexible, so as to operate in a complex environment, while adaptability is becoming a critical requirement not only for development, but rather for survival. To be adequate to the global world, the armed forces have to be an adaptive instrument of national power, ensuring the political use of this instrument on a wide range of threats and scenarios. The military theory of the 21st century, enabling the tackling of the new complex security environment is leaning in a specific form on the paradigm of nonlinearity and the theory of complex adaptive systems.

1.3. The Theory of Complex Adaptive Systems and the Continuum of War

The picture of Earth when seen from space is stunning. The oceans and continents are intermittently screened by clouds, changing the whole image continually and precluding any predictable consistency. The generated images will change in fanciful patterns, with no orderly behavior to give a hint at what the planet is going to look in a short time. The earth view from space can serve as a metaphor for the world community, whereby the personalities, social groups, the armed forces and states modify the total picture by continuous interaction. The world system, like the planet, is complex and ever changing through the interactions, mutual adaptation and coevolution, taking place on a multiplicity of levels and scenes, from a single individual to the societies and the International system as a whole. As a rule, the boundaries in the world community, in all its cultural, ideological, intellectual or economic dimensions turn out to be subject to changes [54, p. 1].

The afforested example shows the significance of metaphor and analogy when examining the complex problems and phenomena. Moreover, the metaphors and analogies are becoming an integral part of the intuitive comprehension and an instrument enabling man to cope with complex challenges¹. These two figures lie in the base of the mechanisms for the so-called naturalistic decision-

¹ Using the metaphore in Military Sphere in the context of complex adaptive systems is discussed in [27].

making built up on the principle of the military or Wall Street making decisions while running out of time¹. In the non-linear interconnected world of the 21st century rivalry and conflict are normal, rather than anomalous, which situation the theory of complex adaptive systems is trying to represent. Through the conditions of peace, crisis and conflict the complex social systems interact and respond to one another's activities, undergoing change and modifying the environment.

Nonetheless, the Western military thinking and perception of war by the society remains linear in many ways. It is our expectation that the same actions or efforts will elicit similar responses, that we shall be able to trace the cause and effect chain associating the original stimulus, or cause with observable effects. That is in many ways an effect and reflection of the century-old domination of the linear paradigm in the Western world [73, pp. 123 153]. The linear vision of the world remained adequate to the Cold War period and to the political system of the world, constructed around the confrontation of the two superpowers and allowing reducing the world to a black-and-white model [15, pp. 8 9].

The Western military thinking continues to prefer seeking the linear, predictable responses to the linear problems in the complex non-linear world, while the war, being a complex adaptive system (CAS) remains fundamentally unpredictable [17, p. 26]. A detailed examination of the basic provisions and mechanisms of the CAS theory is to be done in a special work. Description of the CAS theory skipping the complex math can be found in the works by Mitchell Waldrop [66] and John Holland [24]. Thomas Czerwinski examines the application of the formal apparatus of the CAS theory in the Military Sphere [15]. The CAS theory interprets war as a collision of the systems whereby each of them is trying to retain its integrity and to adapt to the challenges, such as training and self-organization. Adaptation is going in unpredictable modes, same as behavior of CAS itself [19, pp. 3-28], interactions and challenges being not restricted by war alone, however including a wide context of peace and crisis, embracing the political, economic and other areas of public life [43].

The phenomenon of unpredictable complex adaptive systems is well exemplified by the history of war, when there is no sure and precise explanation of why at this level of combat losses there occurred a breakdown of will in one of the warring parties ruling out further resistance and resulting in collapse. Every conflict in the history of mankind has a breakdown threshold which is unique.

¹ Gary Klein is an applied cognitive psychologist, a pioneer studying decision making on the basis of pattern recognition, which decision making is qualitatively distinguished from decision making on the basis of the linear military thinking, and is relevant to making decisions on the battlefield. He wrote: "It is time to admit that the theories and ideals of decision making we have held over the past 25 years are inadequate and misleading, having produced unused decision aids, ineffective decision training programs and inappropriate doctrine..." [31, pp. 56-64].

Let us cite three historic cases. Case one: Blitzkrieg 1940, when France's will to win turned out to be weak at all levels of the country's political leadership. The resulting military resistance was born down in no time, although military contingencies and material resources enabled the resistance to be continued¹. A more profound scrutiny of the French case shows that the Blitzkrieg had succeeded mostly through the psychological weakness of the leadership of the Third Republic and the deep cracks in the French society, as well as through the split having started since the formation of the Third Republic in 1872 [52]. However, the will of the nation had not been completely broken, and the society was prepared to carry on the struggle, since there was still hope to reverse the situation and achieve victory, as attested by the Resistance just following the capitulation.

Case two is associated with World War I. The Central Powers, particularly Austria-Hungary and the Ottoman Empire, held out four years, despite huge losses. However, by the summer of 1918, the will to win had been so worn out that there was a breakdown, so that resistance terminated before the countries of the Union were conquered by Entente. Apropos, the collapse occurred against the background of the deployed field forces.

Case three is Germany and Japan in WWII, when despite enormous losses and an almost complete obliteration of military potential, both continued to put up a dogged resistance [53, p. 27]. Meanwhile, after the defeat these countries showed no resistance, since there was no hope that there should ever be a chance to alter the current situation [36, p. 180].

These cases illustrate the continuum of war presenting specific military campaigns as points. At one edge of this continuum are cases similar to Denmark which accepted German occupation in 1940 with no resistance, on the other end is a fierce and doomed resistance by the Germans in Berlin and the Japanese in Okinawa in 1945.

The non-predictability of CAS makes appropriate the terms like intuition, when trying to predict its behavior. The development of CAS may look mystic, as noted incidentally by Maris McCrabb [40]. This makes the cause-and-effect links between stimuli and responses indeterminate. The links can be direct or indirect, open, observable and latent. E.g., we will never know, precisely what actions by the coalition forces made Milosevic surrender in Kosovo [25]. In all similar cases we must be guided by the maxim by Aristotle: "satisfied with the degree of precision that the nature of the subject permits, and not to seek exactness when only

¹ By the time the French Government capitulated there was a plan for redeploying the center of the French Resistance along with the French Navy and the part of the Army to be moved to Northern Africa, where a large part of the French Armed Forces had already been deployed.

approximation is possible.” [76, pp. 55, 56], putting restrictions upon the process of studying, developing and planning the CAS.

We shall never be able to thoroughly know the system and to unambiguously predict its responses to specific stimuli. Moreover, CAS can change as a result of our efforts to study it, this change being unpredictable. The knowledge of system's behavior with the known stimuli does not mean that we can expect similar reactions in a similar situation in the future. All that we can do is to theoretically restrict the enormous number of possible reactions and to look at a subset of the most probable behavioral patterns [54, p. 75]. The idea of probabilities and criteria not yielding to formalization enables us to understand the way we can develop, plan and adapt those systems. That will bring us to the conclusion that when working with CAS, we are looking at its adaptation, rather than designing or predicting its behavior [17, pp. 26-29]. In the book “Adaptiveness in National Defense” Paul Davis K., David Gompert and Richard Kugler show the effect of this finding upon the process of defense planning on a high level [16]. Another feature of CAS resulting in unpredictability is its lack of respect to hierarchy. Insignificant events at the micro level can affect the events at the macro level. The reverse is also true, when, e.g., words and behavior of the leaders, directly affect the behavior of the rank and file.

Complexity and unpredictability seen in the complex adaptive systems is not something new for the military thought. It is amply described by Klauzevitz characterizing war as a confrontation between two fighters (Zweikampf) [74, pp. 109-149]. This metaphor can be well described within the model of CAS interaction; it can also be extended without being restricted to engagements of equally strong opponents, to also examine the asymmetrical conflicts with each side making numerous contacts in order to detect vulnerable points. The theory of CAS states that each party taking part in a conflict will adhere to the chosen tactics and strategy as long as they enable her to tackle the challenges from the opposite side, including those involving adaptation. When the chosen course of action no more responds to reality, it will be altered, using the available resources, both military and political, economic, et al. This behavior will display all facets of the conflict, so that the process of the course adaptation will initiate repetitively, from one collision to another, until a favorable course is found to deal the final blow to the enemy, or else one party exhausts its options, intellectual, psychological or physical resources [54, p. 59-60].

Formation of responses to the emerging challenges through adaptation can be described in terms of training and innovation. Barbara Tuchman in her book

“The March of Folly” presents a series of historical cases when decision makers were not able to learn and were not ready for innovations that would enable to tackle the changing reality. This resulted in a self-destructive policy that looked like one big folly [58, pp. 380-387]. William Duggan in his book “Strategic Intuition” [18] examined the role and significance of strategic intuition and strategic innovations. The author describes the way the strategic intuition is achieved, its importance for implementing breakthroughs into the outfield and when solving the unfamiliar problems. Duggan shows a distinction between the intuition of an expert and the strategic intuition. Expert intuition works relatively well in a well-explored field and problem, suggesting tactical action, while the strategic one is for the strategic action. “Expert intuition works for familiar situations...But strategic intuition works for the unfamiliar” [18, p.7]. To find the right answer and to choose the right tactics is the essence of expert intuition. As to the strategic intuition, it is distinguished from the expert one in three key moments: Firstly, it is applied in a new situation to an unfamiliar problem, secondly, it works in a time scale with no time deficit, thirdly, it uses many existing tactics and approaches in new combinations.

Thus, the theory of CAS, independent of what is under examination, a country, army or personality, offers only one efficient approach enabling the system to achieve efficiency when colliding with other CAS and environmental challenges, - to be able to learn, drawing lessons both from success and failure, converting the gained knowledge into experience and innovations. This is the only way to handle to continually changing environment and the enemy. This adaptivity suggests a pre-born ability of the person or an entity to learn, and, what is far more important, the freedom of innovations, i.e., the ability to apply new ideas.

Considering the military reality as a phenomenon of chaos and indeterminacy, appearing insurmountable for a long-time military planning, is coincidental with the war as seen by veterans. The battle experience by the partakers tells them that the real world contains none of the patterns and correlations claimed to be there by staff officers and military planners of all levels. For those people a military operation is nonlinear, unpredictable and complex, and the battlefield is very much unlike the predictable, controlled and quantitative operational field of the synthetic models developed by staff officers. It is the complicated reality of battle and war that makes the veterans skeptical with regard to the possibilities of transformation and military revolution as a whole [54, pp. 57-58]. Combat experience tells them that no technologies can deliver us from the friction and fog of

the war, and that the attempts to ignore these basic characteristics may have fatal consequences [67, pp. 27-32; 9, pp. 59-90]. And finally, no one can get abstracted from the human dimension of war and the maxim that wars are being conducted by persons and won in the brains of adversaries [22, pp. 22-25].

The unpredictability of CAS behavior will secure the point of convergence between the theory of CAS and combat experience. Both the war veterans and theorists of complexity warn that in the world of complex adaptive players surprise becomes normal. To cope with it or at least to limit the force of the inevitable shock as well as its duration when looking at unexpected developments of the situation, we have to regard the enemy as a clever opponent at all levels of military confrontation, as well as to consider all means and capabilities that he will use in his struggle. The adaptive nature of the enemy prompts a conclusion that we have to be in possession of many varieties and scenarios of responding to the emerging situation, as well as to secure speedy transitions from one scenario to another. It is the availability of a multitude of options and the speedy transition from one option to another, making the enemy to revert to defensive strategy is a key to victory in the 21st century.

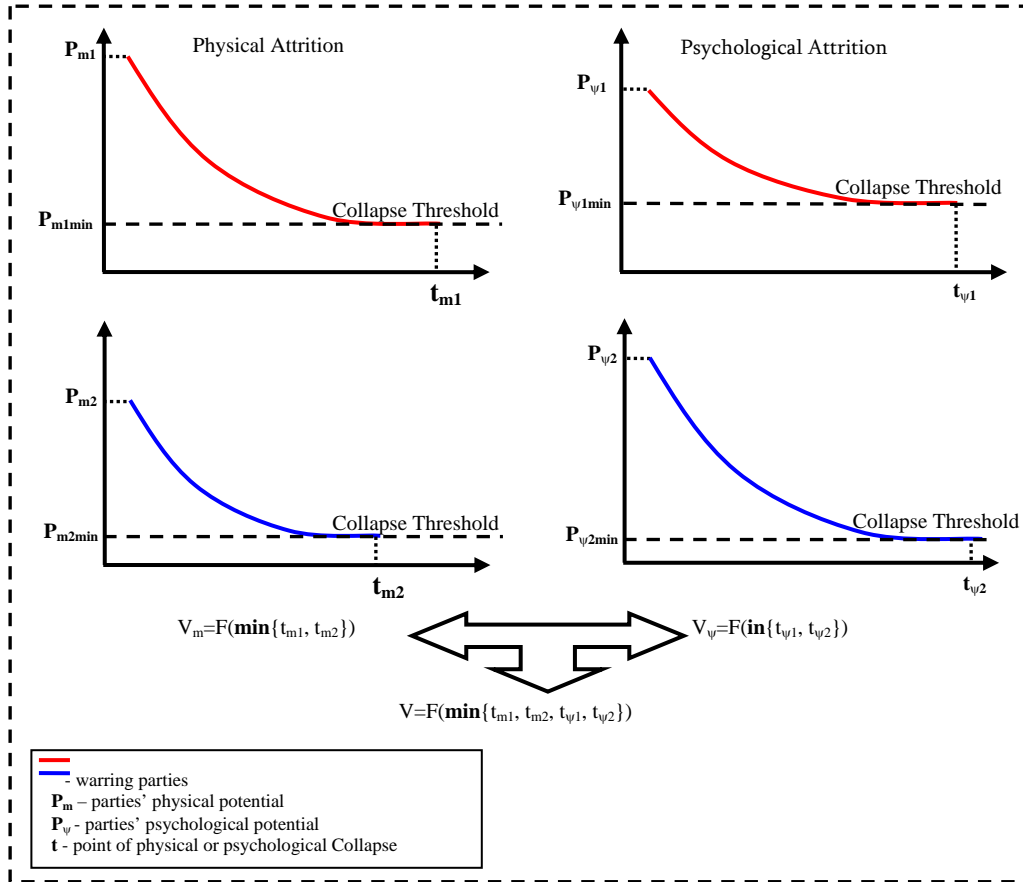
1.4. Asymmetric Wars and the Models of Conflict

1.4.1 Asymmetric Warfare

One of the reasons causing the emergence of new theories and concepts of war is the increased number of asymmetric conflicts¹. This work does not offer enough room for a detailed examination of the problems of asymmetry and asymmetric conflicts. Asymmetry is oftentimes defined through the scale of combat action, strategy and armaments, it should however be considered rather in terms of the asymmetric will and means. In this regard, the large-scale wars of the 20th century were in many ways symmetric (*Fig. 1*), since all parties to the conflict had both means and will to rehabilitate the military potential, so that loss of one campaign or a battle would not produce an immediate defeat. That means that inherent to the symmetric conflict is the strategy of physical exhaustion, when through gradual depletion of the enemy's means to conduct war there occurs a psychological breakdown and loss of will to resistance, resulting in capitulation and refusal to continue the armed struggle.

¹ A Bibliography of Asymmetric Warfare, compiled by *Joan T. Phillips*, 5 December 2007. <<http://www.au.af.mil/au/aul/bibs/asw.htm>>; Asymmetric Warfare and the Revolution in Military Affairs (RMA). 5 December 2007. <<http://www.comw.org/rma/fulltext/asymmetric.html>>.

Fig. 1. Symmetrical Conflict

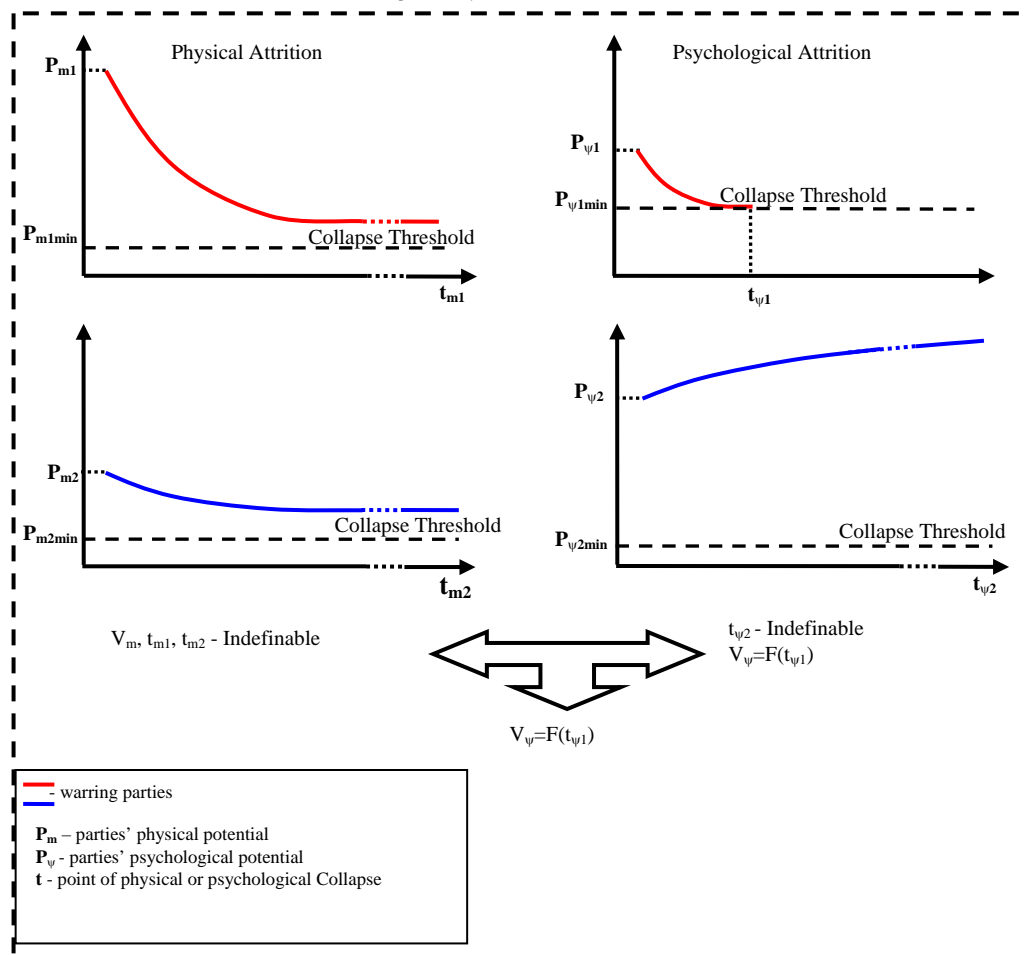


Most of the 21st-century conflicts have a different form and context (Fig.2). More often than not one of the parties has a larger military potential and means, without, however, having sufficient will and motivation to conduct war. This is in many ways explained by conflicts occurring at a distance from the borders of the country having a large military potential, and the armed forces lacking a strong psychological motivation to defend the country's territory. In contrast, the other party has limited means and military potential, but a strong motivation and will to struggle and resistance. Thus, we have two different asymmetries: asymmetry of means and asymmetry of will.

Since a successful warfare assumes creation and use of asymmetries, the country having an indisputable advantage in military potential and physical means to conduct the war, is striving to reduce it to the war for physical depletion. This strategy, if successfully imposed on the opposite side, enables the physi-

cal capabilities of the enemy to sustain the war effort to be rapidly destroyed causing defeat. The strategy of the opposite party is to impose its own strategy upon the strong party. Admitting its inability to successfully withstand the adversary in a large-scale war, it is trying to use its advantage in will and achieve victory by psychologically wearing out the adversary. Widely used here is the media, information warfare, dealing strikes outside the theater of operations, et al. In other words, use is made of all available means aimed at damaging the public consensus in the society with regard to war. In this case there is a sharp increase in the place and role of the effects-based approach, its crucial element being psychological depletion and the human factor [54, pp. 6-8].

Fig. 2. Asymmetrical Conflict



The aforesaid problem of asymmetric irregular operations and warfare is not new, having at least a 60-year-old history¹. Appearing in the 21st century are new factors necessitating corrections to be made in the existing concepts of counterinsurgency (COIN)². Irregular groupings in the 21st century can use the vulnerability of the global world, non-traditional combat technologies, including suicide bombing, the advantages of the new age: mobility, porosity and transparency of borders, electronic media, Networking, etc³. Evidently, irregular forces cannot inflict a serious damage on the material base of the attacked society, so that there can be no question of a military victory in a traditional sense. One can deal with a psychological depletion of the society and a psi war, having its own rules to be taken into account by the attacking party. In particular, an excessively efficient attack can produce a countereffect causing consolidation in the attacked society that would give a carte blanche to the political leadership to continue the large-scale war. It is this very response that could be observed in the American society following 9/11, which legitimized military operations in Afghanistan and Iraq or in the Russian society after terrorist attacks in Moscow.

Thus, the qualitative changes of the form and character of warfare in the 21st century result in a pressing need for revising the existing models of conflict and developing the new ones⁴.

1.4.2. Models of Conflict

The traditional Linear Model of Conflict. The linear thinking of Cold War, in US in particular, was prone to divide the conflicts in two categories: "major war" and "operations other than war" (OOTW)⁵ (*Fig. 3*). The dichotomy was built on the assumption that small threats can be overcome using small military efforts and the same instruments that are used in resolving large conflicts.

This division results in many ways from the European model of warfare, which still frames the Western military thinking and public opinion. Its origin

¹ See [39].

² The latest developments on this problem in US can be found in [63, 64]. In October 2007 an issue was made of a new manual "Counterinsurgency for U.S. Government Policymakers: A Work in Progress. [64], which is a textbook for high-level politicians and people developing the US International policy and strategy. In contrast to the Army Manual, the book is written in a non-military language, is not an academic document, and combines the modern theory of counterinsurgency and the experience of US, GB and Australia for the past several years. This is the first serious attempt by the Government to generate a frame for counterinsurgency of a national scale since the time of Kennedy Administration.

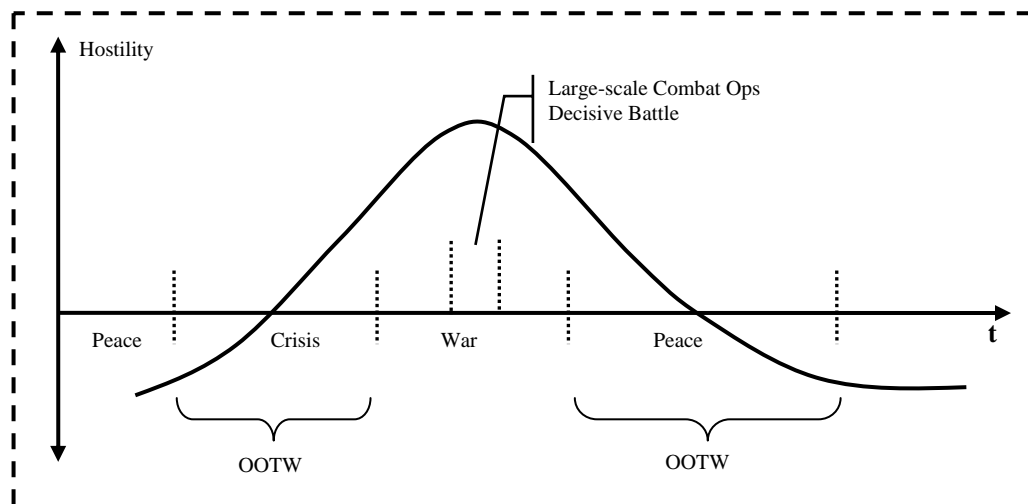
³ См. например, [38, 21].

⁴ Модели войны рассматриваются в [54, pp. 9-33].

⁵ See principal concepts of OOTW in [59]. Bibliography on OOTW, 5 December 2007. <<http://www.au.af.mil/au/au/bibs/mootw/mootw3.htm>>

can be traced to the mid-17th century, the image of the war being presented as an activity of state-supported actors. The beginning of war in this case is a very definitive action: it is a formal declaration of war with the ensuing combat activities between the armies of the warring countries. Meanwhile, the insurgent wars, like, e.g., the war by the Spanish guerillas against the French invaders (1803 – 1810) was regarded as inadmissible deviations, rather than as an acceptable type of war. The peace was concluded as soon as one of the parties lost a decisive battle or was unable to continue hostilities. After the peace treaty was signed, the population of the states returned to normal life and the hostile attitude as an attribute of war, gradually receded. In other words, to achieve victory in war, it was necessary to defeat the hostile army.

Fig. 3. Traditional Linear Model of Conflict



Developed within the framework of the traditional model of warfare was a relevant legal support, there were distinct time limits of transitory interstate relationships between peace and war, supported by the relevant procedures from International law, which were observed to some degree by all parties to the conflict. The International law regulated the state of peace, the threatened period, combat activities, signing of peace, et al. There were also the standards regulating the conduct of troops during peace time, the transition of the country into a state of war, including the terms stipulating the grounds for regarding the future or ongoing war as just and legal, both morally and theologically (“a just war”). Those criteria and substantiations are encountered in the works by Augustine the Blessed [50], the same principles lying in the bases of the work by the UN Security Council. Even today, the regulatory base of the International law continues to accom-

pany wars and crises, despite the evidence that this traditional model of conflict in the pure form has been extremely rarely applied. History provides multiple exceptions, associated, e.g., with the colonial wars or with the wars involving the non-European states. However, the model assigned the frame defining the borders between the legal and the illegal and enabled the assessments to be made to conflicts, war and the ensuing peace¹.

“The Three-block War”. Charles Krulak, the former commander of a marine task force, suggested the term “three block war” describing the complexity of the contemporary military operations [34, pp.139-142]. In one block of this war the marines do humanitarian operations, like aid to the local population. In block two the marines separate the local opposing groupings, trying to maintain the fragile local peace. In block three they have to fight in a tough combat action. The additional complexity consists in the need to act in all the three blocks at the same time and often in the same area or a population center. In this case all the three blocs turn out to be intertwined and affecting one another, while transitions from one type of combat activities to another can occur very suddenly. This creates tactical and even operational problems, since the commanders of all elements have to take rapid and often non-standard decisions. The aforesaid complexity has produced a concept of “a strategic corporal”, when a young fighter in the front line, would at times take tactical decisions exerting influence at a strategic level [35].

In the environment thus mentioned, it becomes difficult and even impossible to draw a distinction between combatants and members of the population, which makes it difficult and even impossible the use of artillery or air strikes. Under these conditions, the logic of survival and the laws of asymmetric war compel the party having a military advantage to depart from the 17th-c. War paradigm leading to losses, suppression of combat spirit and eventually to defeat. Similarly, the opposite party will also have to violate or ignore the requirements of the traditional model in order to obtain the chance to use the asymmetric tactics. Thus, it is within the strategic, operational and tactical interests of both parties conducting the asymmetric warfare, to load it with more and more complexity. That will raise the demands to the professional and general training standard of the fighters and commanders, making the human factor critically important [54, pp.25-26]. Additional complexity is introduced by the influence of the part of the International, political and diplomatic scenes.

¹ For a brief description of the warrant of law for the use of force, International Military Legislation, etc., see [48].

Moreover, when taking decisions, one has to be aware and to account for not only the total military situation, military potential, but also the social and cognitive domains of the enemy, the enemy's way of thinking, his plans for victory, his family relations, relations between the social, political and religious groups and religious groups and clans, the problems between the different regions of the country, in the society, in the nation at large, etc¹. In this complex and rapidly changing environment the decision makers must be prepared for non-standard and speedy decisions. Meanwhile, decisions are mostly taken at the lower levels of control system, since the speed of the processes prevents the involvement of experts or the commanding officers of higher qualifications. Whether to act or to go on collecting additional information while risking losing the very feasibility of option and implementing the worst scenario².

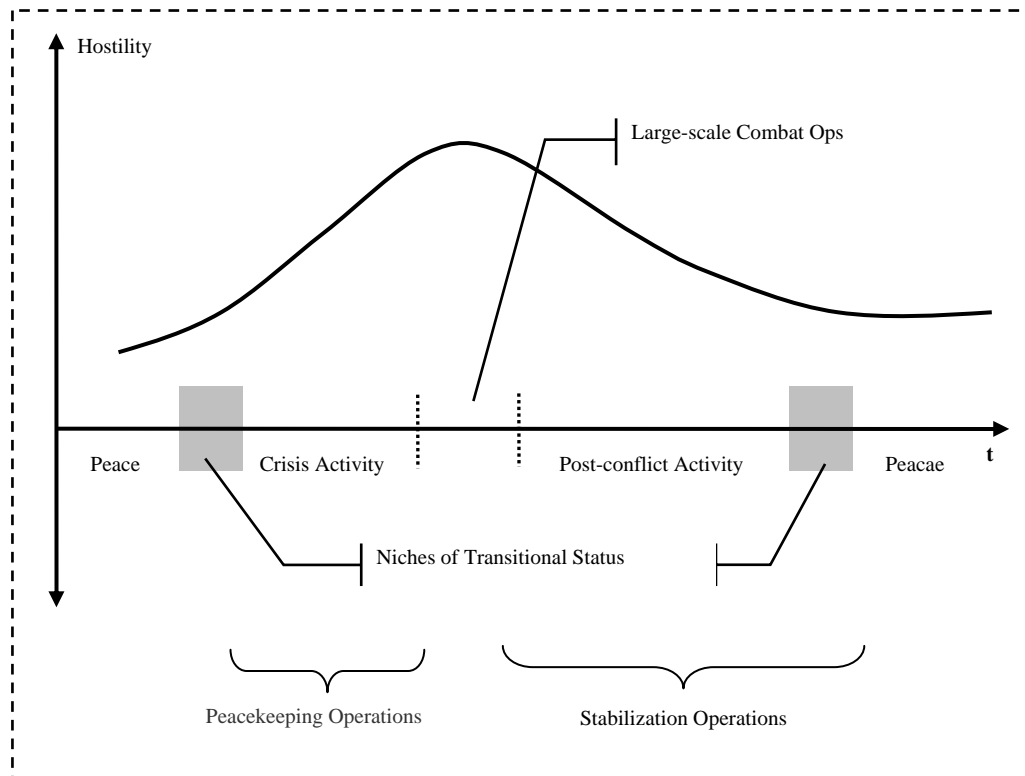
A Non-linear Model of Conflict. Although the old model continues to dominate our thinking, the 20-century war has often developed within another model, wherein an assault and the onset of combat activities precede the declaration of war. A reference can be made to Japan attacking Port Arthur in 1905 or Pearl Harbor in 1941, aggression of Germany against Poland in 1939 or against USSR in 1941. In the late 20th century a great number of conflicts failed to end up with a signature of peace, but continued to smolder instead in a frozen conflict. The wars and crises of this kind can be with certain provisions compared with a formalized code of rules within the legal field of the traditional model. Identification of any stages or transitions within those rule is very problematic, so that most 21st-c. wars can be termed as "correct wars".

Instead of the discrete set of modes, the new model assumes a continuum of rivalry and conflict (*Fig.4*), harboring all efforts of the nation, including the whole available set of instruments for deterring and intimidating the enemy, from displaying the military force to its local deployment. Transition between peace and crisis or crisis to war is not only unclear, but is rather an individual niche of transient condition, having its own logic and its own vulnerable spots. The party adhering to the new model and aware of the niche can try to use it, a chance that is denied to the party staying within the old model [54, pp. 11-15].

¹ For these problems as seen in the aspect of Iraq War, see [55, p.13].

² From the report by Bishop Artemis: "In the village of Cernica, near Gnilane, Miomir Savich, a teacher from that village was once sitting in front of a small Serbian café with his friends. Albanian terrorists bombed the café and fled. Miomir was severely wounded. He lost a lot of blood. People tried to help him, but when Armerican soldiers appeared, they blocked access to him... The Alban ambulance surgeon and three nurses wanted to help him, but were denied permission. ...After two and a half hours a helicopter with medical help arrived, but it was late, Miomir, surrounded by the American soldiers, was dead" [77].

Fig. 4. Non-linear Model of Conflict



In the new world of irregular and asymmetric wars it becomes impossible to identify the point of inception or termination of the hostility of the warring parties. The hostility, being an attribute of the “state of war” stage in the old model, is now embracing the whole continuum of the crisis. Inside this condition we are still able to identify with a degree of authenticity, the start and end of large military operations, however, the end of large-scale combat activities already does not indicate the end of hostility.

Moreover, the enemy is rather adapting to a defeat in a conventional war making a transition to other forms of warfare and hostility, the process going on until the options at his disposal become depleted, or there is a breakdown of will. The non-linear nature of complex adaptive systems describing the functioning of this model results in the Stability operations being transformed into a number of cycles with terminations that can be defined quite informally and often retrospectively. The success of an operation can be measured by an acceptable level of instability and a gradual reduction in hostility. Comparison of traditional and non-traditional models of conflict is given in *Table 1* [54, p.11].

Table 1

Comparison between the Traditional and Non-traditional Models of Conflict

| Traditional Model of Conflict | Non-traditional Model of Conflict |
|---|--|
| Nation-states against Nation-states | Nation-states against Non-state Actors. |
| Alliances | Coalitions, International Organizations |
| Declaration of War | A Fuzzy Transition to War |
| Hostility Focuses on the Military of the War-ring party | Hostility is Spread over the Entire Society |
| Peace, Crisis, War | A Continuum of Operations |
| Clear-cut Legal Foundations and Rules of War. | Controversial Rules and Legal Foundations, Observed by One Party Only. |
| Separate Efforts by Military and Civil Authorities. | Coordinated Efforts by the Entire Nation |
| The Principal Area is a Physical Battlefield. The Purpose is Physical Attrition of the Enemy. | The Principal Area is Psi-confrontation. The Target is Electronic Media and a Psychological Attrition of the Enemy. |
| The Victory is a Victory in a Decisive Battle. | The Victory Results from a Political Defeat Inflicted upon the Enemy. |
| The Victory is a Result of a Complete Defeat Inflicted upon the Enemy. | The Victory Results from the Enemy Having no Options or the Breakdown of Will, with a Subsequent Renunciation of Armed Struggle. |

The abovesaid complexity is associated with mutual dependence and interaction of elements in the system whereof the new model is being described.

The actions (system responses) here of today affect its subsequent actions through feedback chains and the environment. Consequently, examining the conflict and its continuum, we can metaphorically perceive a cycle or even a series of cycles, rather than a straight line (*Fig.5*), the cycles not necessarily reflecting only large-scale combat operations. E.g., an internal cycle can be associated with a movement from peace to some forms of engagement within the niches of transient state and the attempts to reduce the instability, to go over from the mode of intimidation to negotiations of to diplomatic contacts. The second cycle can reflect a development of some form of crisis: humanitarian, economic, political or military, with recurrences of some forms of peace, including the use of peace-keeping initiatives. The next cycle can reflect a crisis accompanied by low-intensity military action. And finally, the largest external cycle can involve large-scale combat activities with a relevant level of hostility.

Fig. 5. Cyclic Continuum of Conflict

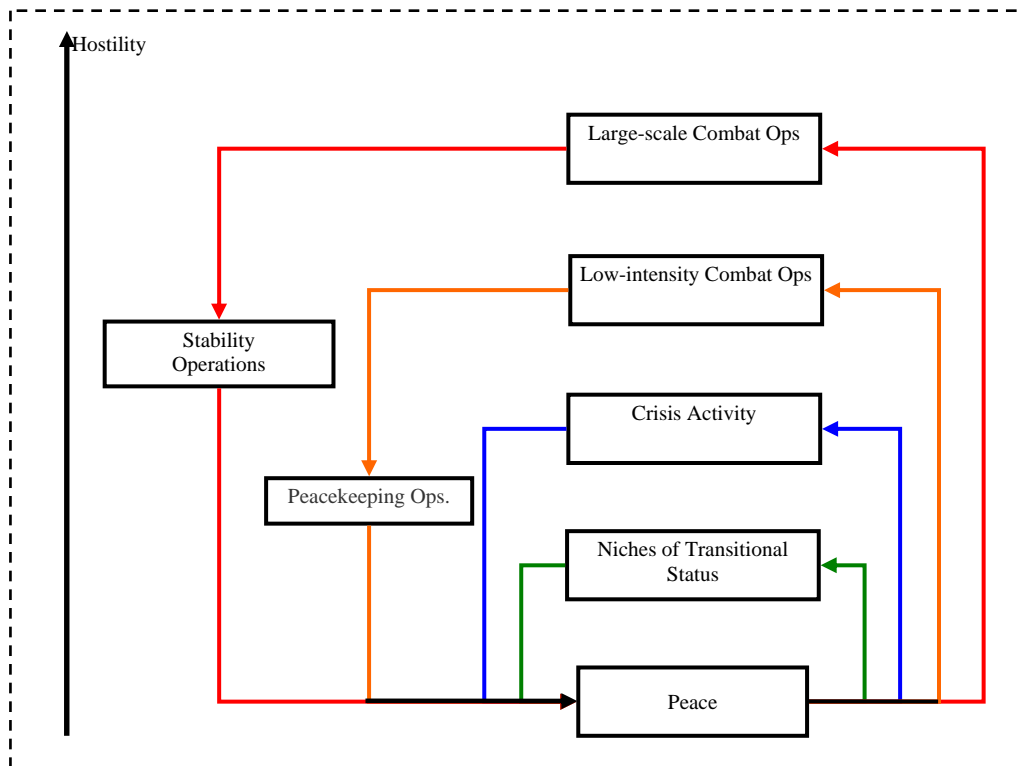
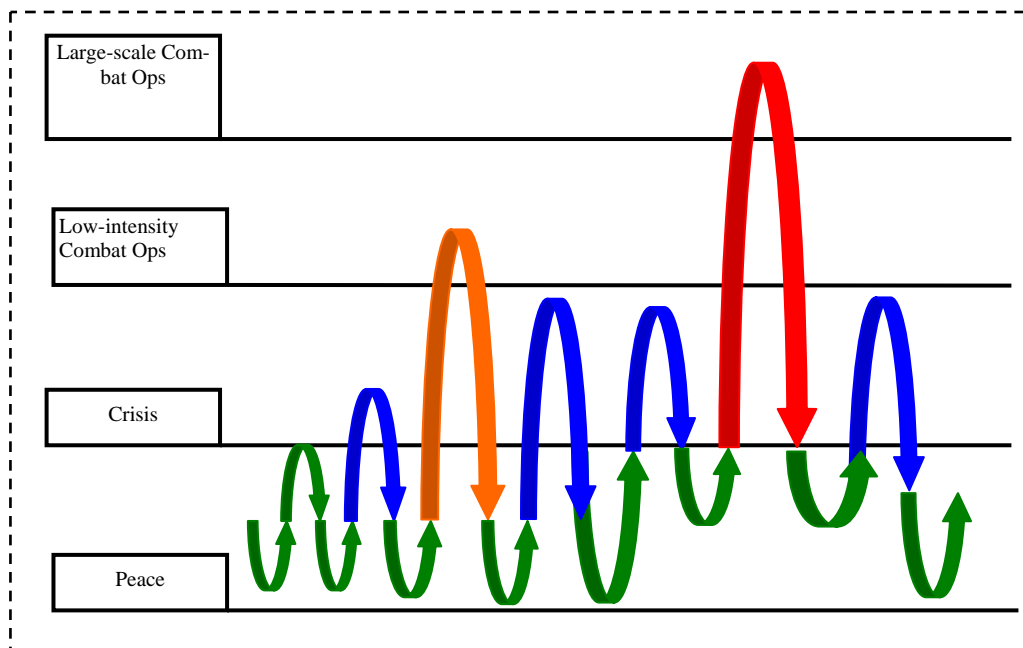


Fig. 6. Spiral Continuum of Conflict



The previously considered model supported by the CAS theory does not allow returning to status quo within its framework, since the initiated cycle will modify the original data making the return to the initial condition impossible. The metaphor of the crisis and conflict is represented by the spiral of interactions with the cycles varying both in amplitude and pitch, with regard to the scale, speed and nature of included interactions (*Fig.6*).

A cyclic view of the development of crisis or society at large is not quite new, we can see similar interdependent cycles in history¹. The impact of the so-called long waves [78] upon the Military Sphere has been known for quite a long time. It is this type of cyclic activity that is associated by many writers with the 45-50-year cycles of major wars in European history [20]. E.g., the period since the Versailles Conference that had completed World War I, is a sequence of crises of differing nature and intensity, resulting eventually in World War II. How much this course had been objective or predetermined, and whether it resulted from political or economic miscalculations in the course of the crisis, is immaterial. E.g., the Versailles Conference imposed so humiliating economic and military terms upon the Weimar Germany, that the collapse of the German middle class and the emergence of Hitler and Nazism became inevitable, as a specific response to humiliation and the Great Depression [68, pp.501-510].

The new continuum-model and the military reality of the 21st century enabled a finding to be made on the nature and origin of complexity of the contemporary military operations which turn out to be in some way associated with the interactions, the said interactions being focused rather on the human dimensions of the conflict; the interactions are holistic, embracing an entire nation or a coalition; a necessary element of the operation is the International context and the processes occurring on the International scale [54, pp.15-16]. It is meanwhile irrelevant, whether we proceed from crisis escalation to large military operations or we consider the stabilizing stage and operations on restoration of peace or peace-keeping operations.

Thus, the imperatives of the 21st century urge the society to effect the transformation of the Military Sphere in order to secure its relevance to the new era, its challenges and threats.

¹ For cycles in military history, see [79].

2. Transformation of the Military Domain

2.1. The need for transformation. Transformation and the Revolution in Military Affairs

It became evident in the 21st century that the imperative of military transformation is not the result of theoretical research, but rather an urgent call of time. The objective character of globalization leaves no alternative to the transformation process of military domain. It is sufficient to remember the example of France that could not use its chance, and in 1940 it became clear that there was no alternative. The 21st-century world has been transformed qualitatively, it has become more complicated, and there appeared many new, often asymmetric threats, which cannot be countered on the basis of the institutes and concepts of industrial society.

Transformation of the Military Sphere is an urgent need for Armenia bound to lean upon the progress of military thought, concepts and organizing experience of other armies and states. Attempts of directly copying the decisions of others are initially doomed to failure, having no chance to overtake the speedily changing world and the International security environment. Success is possible only through initiating one's own transformation, using, no doubt, the experience of other countries, but leaning upon the strictly Armenian military logic, the inherent potential and capabilities. Evidently, this transformation will initially fall behind the approach oriented to copying other concepts directly; it will however have the needed potential for a gradual bridging of the gap between the current status of Armenia's military establishment and the ever-changing requirements to it.

Thus, prior to initiating a transformation of the military domain, it is necessary to outline its objectives. A misunderstanding or an incomplete understanding is inadmissible. Military reforms without clear understanding of their meaning is hardly a specific Armenian feature, incidentally, admiral Mike Boorda, Chief of Staff, US Navy, once expressed himself rather bluntly saying: "it sure would be nice if we had some clear idea what it was we were trying to do first."¹

The literary sources provide two approaches to developing the military domain: induction and deduction. The method of induction is focusing on detecting weak spots in the military organization of a state, the existing gaps and problems, with complex measures on their elimination. It is a traditional method of resolving problems of military development in the 20th century leaning mostly on the processes occurring in the Adversary's military domain. It is not an overstatement

¹ Quoted after [53, p. xx].

that the US and USSR developed their armed forces in the 70s and 80s on account of the mutual adversaries [11, p. 2].

Nowadays, however, some military theorists started to perceive the need for changes in the strategy of military development of states and the transition to deductive thinking and capabilities-based planning. The capabilities-based planning provides a frame for comprehending the challenges and threats confronted by the country's military establishment in the 21st century. In this case the military development will be guided not by the condition of the enemy's armed forces or one's own problems, but rather by the challenges encountered by the Military Sphere and the society at large [11, pp. 2 - 3]. Just challenges, rather than the already manifested problems and threats, initiate and guide the changes in the state's military establishment, by creating the necessary premises for the strategic preacting, for the active, rather than passive reflective strategy. Evidently, capabilities-based planning yields a qualitative change in understanding the transformation of Military Sphere in the 21st century.

Following the military researchers of other countries, we can state that the need for transformation has been caused by sharp changes of the ways the wars are conducted in the 21st century, that is by the Revolution in Military Affairs (RMA)¹ [33, 42]. Using the frame of military revolution enables the lessons and warnings to be drawn of the earlier RMAs facilitating the understanding of the development and deployment of the new theories of warfare. Moreover, it will enable us to understand, whether the new concepts are indeed revolutionary, or we look here at quantitative, rather than qualitative changes. Are they sufficiently new and have they the necessary potential to transform the Military Sphere and update it to match the new security environment?

The best known and successful application of the true military revolution is the Blitzkrieg of 1940 enabling the Wehrmacht defeat the French and the British Armies in Northern France. The Blitzkrieg was leaning on two revolutions. Firstly, it was the military technical revolution associated with the new military technologies. Secondly, it was a direct revolution in military affairs associated with applying the new technological capabilities to the new tactics, doctrine and the military organization as a whole. There appeared a new concept of war that had been developed by the German military genius for decades. The new military technology, including radio, tanks, massive support of land-based operation from the air was accessible to both of the warring parties. Moreover, the British and French armies were better equipped than the Germans. However, the Wehrmacht combined the military technologies with the new, mobile concept of

¹ A Bibliography on Revolution in Military Affairs. 5 December 2007. <<http://www.comw.org/rma/index.html>>

war, which had been at the basis of military organization and personnel training. That enabled the Wehrmacht to achieve a qualitative advantage and prevail in the military campaign [41, 46].

The case of France and Britain having been defeated in 1940 results in two findings which can be applied to any RMA or transformation [53, pp. xxv-xxvi]:

1. application of new military technologies, however efficient, is not sufficient to talk about RMA. Until the new technological capabilities should be reflected in the new concept of war, the military doctrine and the military establishment of the state as a whole, they remain practically useless. The fact that the new technologies are operational and even can be efficient within the old and service-tested military doctrines can even play a negative role leading to some sort of a plot on the part of the old approaches, which will inevitably produce defeat;
2. any successful RMA should go beyond the tactical level and have operational and strategic dimensions. On the tactical level the Maginot line was a brilliant structure, the Wehrmacht made no attempt to assault it, and the fortifications remained combat-ready until the signing of capitulation by the French. The Blitzkrieg initially, on a strategic level, had aimed and achieved a psychological shock, resulting in a collapse and paralysis of will of the French political and military leadership. France was capitulated, although it had the necessary resources for resistance and could continue struggle supported by the military force in North Africa.

To achieve advantages over the enemy, RMA can revert to the old forms of warfare hoping that the latter will not be able to adapt. That was exactly what was done by North Viet-Nam and General Vo Nguyen Giap [44, 45], who adapted the principles of guerilla way by Mao Zedong [57, 51] in order to organize resistance to Viet-Nam war in US. The concept of guerilla war required a minimum of new technologies and instructed to evade the large-scale battles of the industrial age, so brilliantly mastered by the US armed forces. The strategy of North Viet-Nam was focused on organizing a long-time small war and attrition, aiming at breaking the will of the American society rather than at inflicting physical damage. Meanwhile, in contrast to the Blitzkrieg of 1940, making a wide use of the new military technologies, success was achieved through the asymmetric concept of war. Revolutionary approach, thus, was associated not with technology or other means and capabilities, but through strategy and the form of warfare enabling to successfully withstand the incomparably stronger and better equipped US armed forces.

The distinction between the technologies and the military technical revolution [33] on the one hand, and the concepts and the revolution in military affairs on the other hand is important for understanding the nature of transformation in the 21st century. It should be understood that the technological capabilities of the new era can also be used by the enemy, the same way as radio, tanks and air power were not Germany's monopoly in 1940. In the 21st century every nation can carry out its own unique military revolution while leaning on all available world experience and capabilities, both technological and conceptual. Moreover, for the technological support of Revolution of Military Affairs it is not necessarily essential to possess all up-to-date military and technical achievements, besides, the revolution can be financially affordable, provided there is an understanding of the need for transformation and the redness for its initiation [53, pp. xxix-xxx].

2.2. Transformation and the New Theories and Concepts of War

In his book "Information Age Transformation: Getting to a 21st Century Military" Dr. David Alberts describes transformation "a process of renewal, an adaptation to environment", [2, p. vii], initiated by changes in both technology and the security environment.

Here is Transformation as defined by the US Department of Defense:

A process that shapes the changing nature of military competition and co-operation through new combinations of concepts, capabilities, people and organizations that exploit our nation's advantages and protect against our asymmetric vulnerabilities to sustain our strategic position, which helps to underpin peace and stability in the world [61, p. 3].

Transformation is becoming a new source of power resting upon network thinking. While the 20th-c. military thinking was aimed at evaluating the combat capabilities of military detachments on the basis of component units, the 21st century sees a gradual shift, when the crucial factor is a capability of a single combat unit or a military detachment or the military establishment as a whole to work within a network and to display a networking behavior. In other words, the 21st-century military thinking has a tendency to become network-centric.

Transformation is yielding new sources of power ... One such source is information sharing through robust network structures. We have a mountain of evidence – from simulation, from experimentation, and from real world experience – that substantiate the power of network behavior ... Each of the Departments' efforts reflects an understanding of this phenomenon ... These efforts reflect the ongoing shift from platform-centric to network-centric thinking that is key to transformation. [10, p.42].

This finding facilitates the understanding that any debates around transformation will entail examining the theory of Network-centric Warfare (NCW). We shall return to this problem in another work, restricting ourselves to the NCW definition only. The 2001 Report of Defense Department to the Congress, triggering research in NCW examined the impact of network and networking mentality upon the three domains of warfare (physical, information, and cognitive) with the purpose of generating a growing military might by: improved synchronization on the battlefield; increased rate of command; greater lethality, survival rate and expediency [60, pp. 3-10].

In the book *Network Centric Warfare, Developing and Leveraging Information Superiority*, David Alberts et al. give the following definition of NCW:

NCW is about human and organizational behavior. NCW is based on a new way of thinking, network-centric thinking, and applying it to military operations. NCW focuses on the combat power that can be generated from the effective linking or networking of the warfighting enterprise. It is characterized by the ability of geographically dispersed forces to create a high level of shared battle space awareness that can be exploited via self-synchronization and other network-centric operations to achieve commander's intent. NCW supports speed of command, the conversion of a superior information position to action. NCW is transparent to mission, force size, and geography. Furthermore, NCW has the potential to contribute to the coalescence of the tactical, operational, and strategic levels of war. In brief, NCW is not narrowly about technology, but broadly about an emerging military response to the Information Age [1, p. 88].

In order to be complete, the conceptual basis of understanding war and peace in the information era must be complemented with the Effect-based Approach¹. The EBA is to be examined in a separate work; it is focused on the most complicated dimension of the warfare and global society, the human dimension, serving as a frame for understanding and formalizing the problems in the security domain in terms of the theory of complex adaptive systems [54, p. 5].

The Network-centric Operations (NCO) conducted on the basis of Network-centric Warfare, and the Effect-based Operations based on the EBO approach, are certainly connected with the technological basis of warfare. Nevertheless, they can and must be applied on the basis of the nation-controlled technological capabilities. In the meantime, the transformation and development of the new concept of warfare as its inseparable part should be perceived as an evo-

¹ Air University. Effects-Based Approaches to Operations Bibliography. Compiled by *Stephen B.T. Chun*, Bibliographer, *Muir S. Fairchild* Research Information Center, Maxwell AFB, AL, 2007. 5 December 2007. <<http://www.au.af.mil/au/aul/bibs/ebo06.htm>

lution, rather than as a revolution of the military domain.

It is important to understand that transformation is a continuous and developing process [12, p. 43], the dynamics whereof is one of the determining attributes. Moreover, the concept of transformation itself is being changed and clarified while bringing it in line with the changes both in the military establishment and in the International safety environment. It is all the more important with regard to the fact that in the 21st century the problems of security and even military security stop being the exclusive objectives and functions of the Defense Ministries and military establishments but rather go out and embrace the entire society. To be adequate, we have to reject a reactive, reflective strategy of responding to the changes in security environment (11, p. 2]. The strategies and policies of military development have to become pro-active and adaptive, suggesting preacting and initiative. This qualitative change in thinking is bound to affect both the structure of the military establishment of the state and the functioning of its individual elements.

The inertia-driven Western military and political thinking results in the perception of war and of the Military Sphere remaining largely linear, despite the qualitative changes happening in the world [75, pp. 35-77]. As a result, the linearity remains dominant in perceiving the transformation processes in the military sphere, when the military thought prefers to focus upon the effectively linear problems, like tactical treatment of large armed operations. However, this approach turns out to be quite unacceptable for the complex security environment of the 21st century, yielding a conclusion that the crucial part of military transformation must be the transformation of the military thinking and consciousness.

That in turn will require inevitable changes in military culture including in particular the military education, the system of training and skill enhancement for military personnel, etc. [12, p.48]. Transformation thus is anyway starting and terminating within the culture, being reflected in the society's system of values and in the behavior of its members. What the nation believes, what it can visualize as its future, will definitely have an effect upon the transformation and its initiated processes [11, p.3].

2.3. The Metrics of Transformation

The changing face of war is more and more acquiring the features of its age, compelling the nations and states to regard the new forms of war with their cultural heritage. Networking and its distribution in the military organization, doctrine, strategy of modern armies will undoubtedly change the nature of war and demand a development of new metrics that would enable an evaluation to be made of the armed forces of the 21st century. Cebrowski suggests at the first level

using the metrics described below [11, pp. 5 7]. It will determine access, speed, sensing, mobility and networking, is independent of the scale, and can be applied both at tactical and operational and strategic levels of warfare, both directly to the conflict and to the threatened period and the period of conflict escalation.

The metrics will enable evaluations to be made of the armed forces: to create and preserve options, to develop high transaction rates, to develop high learning rates, to achieve overmatching complexity at scale.

Creating and preserving options. An advantage in the new age is oftentimes associated with the capabilities and the cost of an option available to the nation. In order to survive, the nation has to be able to develop and to implement a competitive strategy, including the one in the military domain. Competitive ability is in turn directly connected with the variety of possible developments, and consequently, of the options available to the country. Thereby, the availability of choice, creation of terms needed for its retention and extension, is becoming a necessary but insufficient condition for the ability of the country to develop by adapting to the ever increasing complexity of the world and the security environment.

In the 21st century evaluation of combat ability and potential of the country only in terms of the traditional military analysis is becoming risky, since in this case cut off from the evaluation process is the stage of competing ideas, to be enveloped by the military establishment. The historically generated and in many ways justified rigidity and inertia of the latter causes the military establishments to be rather sensitive to any attempts at their reformation. Under these conditions the very idea of a possibility and a need of transforming the Military Sphere encounter resistance in the military environment, quite serious efforts being necessary to overcome it. The new age, however, leaves no alternative to speed and adaptability in all issues of state development, the military one included. Dumping the stage of competing ideas will sharply reduce the scale of options and create premises and conditions for the nation's military organization to be defeated at the top level of the military and state development. In this case no efficiency of the military establishment itself will be able to make up for the miscalculations admitted at the level of strategic, state or political planning.

High Rates of Transactions and Learning. The Information age is characterized by an increased speed of all processes. In the military context it will also mean an increased speed of military operations. Under these conditions crucial importance belongs to the time factor and the transaction rate which is linked with the number of actors taking part in the exchange and the number of actor-

to-environment exchanges [11. p.3]. The high transaction rate is becoming an important and even determining element in the process of training and adaptation, and a pledge therefore of high fighting efficiency.

Moreover, we can also talk about the institutional transactions facilitating the institutional training and the transformation of the Military Sphere as a whole. Stagnation in the processes of institutional training is too expensive. As soon as the new knowledge encounters difficulties in making its way into the military establishment, the country is becoming a strategically fixed, or predictable target, which is of course impossible to conceal from the outside world, observing and evaluating our steps.

Overmatching Complexity at Scale. Ashby's Law of Requisite Variety states that the variety of control measures must match the variety of disturbances. "Only variety in R [the regulator's actions] can force down the variety due to D [the disturbant's actions]; only variety can destroy variety." In other words, only variety can control variety [4, pp. 206-218]. The system principles are rather concisely described in [23, pp. 110]. There is an alternate formulation by Stafford Beer: "A proper control can be provided if and only if the variety of control system is at least as large as the variety of the situation controlled. The larger is the variety of possible actions by the control system, the larger is the variety of deviations which it will be able to compensate" [7, 8]. In other words, only variety can compensate variety, or an adequate response to complex challenges is possible only on the basis of complexity. The concept of variety in this case can be associated with complexity, which is understood as the number and variety of elements and links in the system under scrutiny. The higher is the complexity of armed forces, the more is the option of possible actions when confronting complex challenges and an adversary in complex environment [5].

To remain adequate, the armed forces have to be able to adequately respond to complexity to be found on the whole scale of actions, from tactical to strategic. In order to win, the armed forces have to be able to achieve a superior complexity on the whole scale, which is a formidable task. The complex and variable security environment demands of the military establishment and armed forces of the country ability to adaptation and high rates of transactions. It is to be understood that there are different dimensions of complexity. Traditionally a battlefield is conceptualized in physical terms and dimensions; however the most complex elements of the battle space, such as command and control of operations, have no physical dimensions and cannot be expressed in terms of physical world. As a result, their role is subconsciously underrated. The realities of Information Age

bring in new contributions adding the information space to the traditional battlefield as a separate dimension, which undoubtedly creates a more complex battle space in the 21st-century conflicts [11, p. 7].

2.4. The Theory of Complex Adaptive Systems and the New Theories

At first glance there is a gap between the promises of the new theories and the infinite complexity of the safety environment. While both the behavior of actors and their interaction are not subject to exact prediction and is determined by the factors part of which is impossible to foresee, then what is the way to plan and to carry out military operations, forecast the actions of the adversary, etc.? Aren't the non-linear model of the conflict and the concepts of NCW and EBO a bridge to nowhere and a target beyond reach? Maybe, their implementation will demand a military and political genius, a unique phenomenon in history, rather than a common case of military development [54, p. 65]?

However, the reality is that we are anyway in a complex situation working in complexity every day. The real problem is that we remain prisoners of linear thinking and linear organizing processes, trying to work with non-linearity of the complex security environment, using non-linear logic and metrics. In any case, a linear approach based upon the traditional model of conflict, has a limited application to asymmetrical enemies and to the non-linear challenges of the new age. The realities of the 21st century require formulation of new questions, in particular, how we deal with complexity, and how to use the available concept of complexity in planning, carrying out and evaluating the military operations within the new theories of warfare.

In this sense we confront here some sort of paradox, when understanding the complexity and non-linearity of war and the new security environment will simplify the general picture and enable us to draw delineation. Some security problems are linear, predictable and can be resolved using the classical linear methods. The other part has no exact solutions; we have to restrict ourselves to a set of the most probable solutions. It is stated by the theory of complexity that a single perfect response to complex challenges is inexistent, and that we have to be guided by the maxim of Aristotle¹ [76, pp. 55 56]. A similar conclusion is suggested by the military theory, stating unambiguously that one has to be restricted to the working solutions, applied at the right place and at the right time. As to developing a perfect but belated response to a challenge, it is meaningless and more often than not results in a defeat. We need a solution that would provide us an advantage and a supremacy over the enemy, rather than a perfect solution.

¹ See p. 10.

Thus, the theory of complexity and the military theory make use of the same conceptual frame for working with complex challenges. It means that using the theory of CAS in the Military Sphere is not only possible but simplifies the situation and enables us to be more pragmatic. We are enabled to determine, which of the problems are subject to exact solution, and which are not, so that a search for it is meaningless. Understanding our limitations and capabilities will facilitate and simplify the process of development and decision making in the complex security environment of the new age. Meanwhile the military history will afford a vast empirical material for evaluating the findings of the new theories [54, pp. 67-68].

The theory of CAS simplifies the examination of many complex problems making use of acceptable and working standards of decision making. Adopting the ideas of complexity on contamination will enable identification to be made of complex phenomena and aspects of the problem under scrutiny amidst the simple ones, thereby limiting the problem complexity, dissecting it into a set of specific problems. The complexity as such will of course remain, but the above adopted standard of acceptable solutions will help to identify many individual solutions and increase the probability of making correct decisions [54, pp. 315-316].

Understanding the inherent complexity of the new warfare theories opens the door to speedier processes wherein a thoughtful and timely human intervention will become a key element of success [54, p. 93]. Understanding the human-centric nature of the CAS theory and the new theories of warfare spurn our efforts to reveal the sub-processes resisting to linearization within the process of decision making and requiring human intervention. That enables us to focus on the problem of raising the efficiency of human decision making. Thus the understanding and adopting the complexity and the CAS theory will simplify the problem, enabling us to deal with a set of problems and challenges of differing origins and complexities, with a series of specific problems, rather than with a single super-complex one.

Conclusions

Transformation of the Military Sphere in the 21st century will inevitably embrace the entire society and directly all aspects of a country's military establishment. The dominant pattern of human behavior in the new age turns out to be the networking, which is bound to impact both the character of warfare and the behavior of the military [11, p. 5], demanding a development of a new networking military paradigm wherein the network-centricity should be the key element [12, p. 4]. Transformation of the Military Sphere on the basis of a network paradigm and

the theory of complex adaptive systems will demand changed approaches to the problem of conflict and to developing new models of conflict and the concept of warfare which will inevitably result in the need for setting and resolving the new operational and tactical problems.

The new models of conflict and the theory of warfare do not yield speedy and comprehensive responses to all challenges of the new age, however they provide a conceptual frame for evaluating the military problems and the problems of national security, in the terms of the theory of complex adaptive systems. They enable us to work with complex security environments of the 21st century, focusing upon its most complex dimension – the human dimension [54, pp. 5-6]. In this connection the new theories well agree with the experience of veterans that can be formulated as follows: “Any revolution in military affairs and any transformation have to be started with admitting the complex and human-centric nature of warfare” [54, pp. 58-59].

There is no doubt that the new theories of warfare are a double-edged sword which while being very efficient, suffers from greater vulnerability in case of ignorant or ill-conceived decisions. In this case we do not have in mind the limitations of the new theories, having a developed theoretical basis, but we deal rather with limitations of the linear military thinking, intaking the linearity into the new military theories based upon the paradigm of non-linearity, the said linear thinking trying to reduce them to the technological dimension only [69]. From this viewpoint, understanding the revolutionary character of the new military theories and concepts is critically important, enabling us to understand and account for the limitations, technological and conceptual, drawing up the transformation of the Military Sphere within the framework of the emerging context and the exigencies of the environment.

Meanwhile, the transformation itself in the 21st century turned out to be a complex process, in many aspects leaning upon the culture of the nation, its vision of the world, the said process demanding that changes be introduced into the military culture. Understanding the conceptual basics of transformation of the Military Sphere in the 21st century enables us to understand, in what way, and on what theoretical foundation the transformation of Armenia’s military establishment should take place, as well as the way this transformation will bring it in line with the imperatives of the revived Armenian statehood and of the emerging epoch.

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