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THINK TANK DEL EJÉRCITO DEL PERÚ

Future battlefield that maybe already be present

Carlos Javier Frias Sánchez, Colonel of the Spanish Army. Holds a Diploma of the General Staff, as well as Doctor in International Peace and Security. He holds a Master´s degree in Strategic Studies from the University of Granada and in Security and Defense from the Higher Center for National Defense Studies in Madrid. He is currently deployed in Army General Staff.

Translated by CIVIME and Claudia Iwasaki

Abstract

Technical progress in sensors, guided weaponry, artificial intelligence and UAVs will have a major impact on future combat. In the same sense, the reduction in size of the Armies and the increasing difficulties to replace losses will imply also major changes in their way to operate. The aggregation of both phenomena brings to the fore the old Soviet concept of the "reconnaissance-strike systems" (RUK) which foresaw a fundamental change in the way the Armies' would fight, due to the technologic advance in the aforementioned areas. As the technology is constantly advancing precisely in these fields, most probably, future combat will present many of the features described by the Soviet theorists for their RUK in the past 80s. The development of the recent fight in Libya and, especially, in Nagorno-Karabakh seem to lead us to that outcome.

Keywords

UAVs, reduced Armies, Nagorno-Karabakh, RUK, "reconnaissance-strike complex"

Introduction

The expression "making predictions is very difficult, especially if they are about the future" is attributed to the Danish physicist and Nobel laureate Niels Bohr. However, it is possible, within certain limits, to venture changes when they are based on more or less solid trends. This does not mean that it will be free from mistakes: the "black swans" described by Nassim Nicholas Taleb can always derail the most elaborate of predictions, but it is also true that human beings need these predictions to guide

their behaviour.

One of the permanent features of our time is continuous technological progress. This progress only accelerates.[1] Obviously, there are many technological advances with military application. These advances are translated into the emergence of new inventions, but also in falling prices in some key areas. This cost reduction is very significant in some technologies of obvious military use, specifically in everything related to sensors, satellite navigation, electric motors and batteries, communications, and microprocessors. As a result, many inventions dependent on these technologies have become mainstream: digital cameras (including those with night vision), navigation systems for cars, ships or aircrafts, small remotely controlled vehicles, (land, sea and air) and many others.

Another of the technologies that is expected to achieve great development in the coming years is Artificial Intelligence (AI), even if only in the field of "narrow" or "weak" AI (problem solving restricted to a specific field).[2] This advancement in AI will benefit from other technologies, such as quantum computing and others, that will enhance its capabilities. As can be seen, the technological advances exposed are not "future", but "present". This fact can help reduce the risk that Niels Bohr prevented, in relation to the present work. On the other hand, another factor that is expected to have a decisive influence on the future configuration of military operations is the size of the Armies.

Indeed, one of the common predictions of all prospective studies on future conflicts is that the armed forces involved will become smaller by the day. Strictly speaking, this is not a future phenomenon but, as in the case of the technological advances mentioned, is very present. Today, armies (especially Western armies) have a fraction of the personnel, equipment and budget they enjoyed during the Cold War years, and this trend seems to be more stressed due to the economic consequences of the current COVID crisis.

In return, Western armies are forces staffed with professional personnel and high-tech weaponry and equipment. The common element of these characteristics is that they are resources that take a long time to obtain: it takes years to train trained military personnel and not less time to acquire combat equipment, even in the case of already designed equipment. As a consequence, a professional army is very difficult to replace (impossible in the short term, actually). History offers an example of the consequences of such armies: the eighteenth-century

"professional" armies that led to the "limited war" of that period. In the same way, a small army is not simply a minor version of the armies of the Cold War, but is forced to fight in a very different way than the huge forces that operated in past world wars, or even in the 1991 Gulf War.

The ageing of the population in developed countries and the continuing expansion of the "welfare state" make for ever expanding social expenditures. This is also a present trend. And military budgets —which, except in the event of imminent conflict, may be perceived as less of a priority—, is one of the most likely chapters to be cut in an environment of growing economic pressure on Western states.

Libya and Nagorno-Karabaj

Two recent conflicts have highlighted the impact (more present than future) of these technological advances in combat; those of Libya and Nagorno- Karabakh. In the case of the conflict on Libyan soil, in December 2019, the forces of the self-proclaimed Field Marshal Khalifa Haftar were stopped in their advance towards Tripoli, capital of the rival "Government of National Accord" of President El-Sarraj, by air strikes from UAVs, mainly Turkish ones. Field Marshal Haftar is supported by Egypt, the United Arab Emirates, Saudi Arabia and Russia. This support resulted in the supply of weaponry to its so-called "Libyan National Army" (LNA), including old MiG-21 fighters, almost the only conventional aircraft used in the Libyan conflict, and Russian anti-aircraft systems, such as the Pantsir S-1.

In fact, the LNA was the first party to employ UAVs, with significant success in the areas of Derna and Benghazi. Since 2016 they have been using the Chinese *Wing Loong* model, equipped with *Blue Arrow 7* anti-tank missiles, reportedly piloted by UAE personnel. However, in 2019, the government of El-Sarraj received substantial Turkish support, resulting in the supply of numerous UAVs of the *Bayraktar* TB-2 models (capable of carrying different weapons) and *Anka* (a reconnaissance aircraft, equipped with an advanced synthetic-aperture radar). Despite the exchange of statements from both contenders, each denying their losses and attributing numerous kills to their own systems, the final result is that the LNA had to withdraw, largely due to the action of these UAVs[3], losing even the strategic Watiya air base, the only one near Tripoli. This loss made air support (essential for LNA offensive operations) extremely difficult, precluding it from continuing its offensive.

With respect to the recent Nagorno-Karabakh conflict (from September 27 to November 10 2020), Azerbaijan has successfully employed UAVs of various types (the aforementioned *Bayraktar*, along with Israeli models *Harop/Harpy* —"suicide" drones of the "loitering" type—, *Heron, and Hermes*). In that conflict, fought over a small slice of a small region, and in just a few days, Armenia lost hundreds of tanks (their losses are estimated at 232 T-72 tanks, of which 130 were destroyed, 5 damaged, and 97 captured), in addition to 147 infantry combat vehicles and other pieces of equipment[4]. This number of tanks is more than half of the arsenal of these weapons in countries such as the United Kingdom or Spain, and their loss would mean a severe blow to the combat capabilities of these armies[5] (for example, Armenian artillery losses are estimated in 243 howitzers and 77 rocket launchers, a number far greater than that of the entire Field Artillery in the Spanish Army).

The widespread use of UAVs is a direct consequence of the huge drop in price of the technologies needed for their manufacture and operation, which allows for their production in middle-tech countries, and makes them accessible not only to Great Powers, but also to States with much smaller capabilities or even to sub-state groups. These UAVs have a radar signature equivalent to that of a bird[6] and can fly at very low speeds, making them very difficult to detect for current anti-aircraft systems. Their low price also makes it inefficient in the long-term to shoot them down with extremely expensive anti-aircraft missiles (a missile costs several hundred thousand or millions of Euros, while some UAVs with military capability may cost only a few hundred). This conflict proved that UAVs of medium-to-low technological level may produce huge strategic advantages.

The use of UAVs in the two cases cited has demonstrated a very novel use of the technology: initially they were tasked to destroy the adversary's anti-aircraft defence system, provoking when necessary, the emission of their radars through the use of decoys. Once the enemy's anti-aircraft defence has been neutralized, they have been used as deep-fire vectors, locating (using ISTAR UAVs) the main enemy weapons systems, and destroying them with impunity. That is to say, the destruction of the enemy's anti-aircraft defenses has been the initial (and inescapable) step that has triggered a hard- to-avoid result.[7] On the other hand, the difficult topography of the terrain, which initially for the Armenians was an

advantage, has become a problem, as the dependence of their defensive positions on limited communication routes within the rear area (and with many easily identified required crossing points) has enabled the Azeri ISTAR UAVs to concentrate their operations, increasing their effectiveness. Thus, the Azeris have been able to isolate Armenian positions quite easily, regularly achieving local superiority in fires and in the number of troops involved in each single battle.[8]

Another interesting aspect of the conflict is revealed by the spatial distribution of casualties between the two adversaries: Armenian casualties are equally spread throughout the battle space, while Azeris occur almost exclusively in the line of contact. The Azerbaijani Army were able to use fires in depth (thanks to its control of the air) shaping the battlefield in its favour, while the Armenians were constrained to defending themselves where the Azeris have decided to fight[9]. The dominance of the air has thus given the Azeris a wide margin of initiative, denying it to the Armenians.

Despite the special characteristics of these conflicts (for example, aviation has hardly been used), this form of combat is perfectly exportable to other scenarios. In reality, aircraft radars have the same or more problems than surface antiaircraft radars in detecting UAVs and, furthermore, these devices do not require a bulky infrastructure for their use (Libyans and Azeris have regularly used short road sections such as improvised airfields, while the logistical needs of these small mills are very low). These conflicts are therefore the first step in the realization on the battlefield of the Soviet concept of the "reconnaissance and attack / engagement system" (RUK), which will be described later.

The effect in combat of reduced Armies

The ongoing reduction in size of the armies has many consequences. The first and most obvious is the effect on doctrine: since 1914, the armies of all the advanced countries are used to operating in a very specific way, derived from the existence of "fronts". These fronts were an unforeseen consequence of the "race to the sea" that characterized the first months of the German offensive in France in 1914, while the enormous increase in firepower forced the Armies to entrench themselves along a line of fortified positions. These fronts were lines of contact between opposing armies, which clearly delimited the ground under the control of each side. The fronts were materialized in more or less continuous lines of field

fortifications.

In principle, behind the fortifications that define the fronts, no enemy presence is expected, beyond small units of guerrillas or "partisans", etc. Under cover of the fronts, numerous essential elements for combat are deployed, but those elements are "soft targets" in case of an attack carried out by combat units: Artillery (Field and Anti-aircraft), Command Posts, logistic organizations, communicationsnodes, lines of logistics communications. These elements grew not only in number but also in importance from 1914: attempts to "break" the enemy front (or to prevent its penetration) required an enormous amount of artillery fires, which implied a logistical organization never seen before, without which, these fires would have been impossible; and the side without superiority in firepower was doomed to defeat. In the same way, the Command Posts grew in importance: The Armies were huge, much larger than in any previous period of history, which greatly complicated command and control, and logistics. In addition, the Command Posts had to be able to control impressive indirect fires requiring thousands of howitzers and millions of shells. The development of the aviation obliged a parallel requirement for anti-aircraft artillery.

In return, the protection granted by the fronts allows these elements to be deployed with a very shallow immediate protection capacity, barely enough to confront those bands of guerrillas or "partisans" that could appear (and not always) in the territory controlled by the forces. own forces. World War II presented a much more fluid battlefield, but the general structure remained: more or less defined fronts and more or less secure rear areas with massive armies. Obviously, the first requirement to constitute a front is the availability of sufficient forces to cover the entire extension of the line of contact with the enemy. In 1914, this was not a problem: as an example, the French Army was organized into sixty Infantry divisions, a dozen Cavalry divisions, and many other smaller units. On the same dates, after the mobilization, the German Army consisted of 2.2 million soldiers. Currently, the level of ambition of the largest European states is reduced to fielding one or two divisions in the field.

The current doctrine still contemplates the operation of our units as part of one of these fronts, and therefore, they will have their flanks protected by similar units. However, the number of units which can be deployed today is far from the numbers used in 1914. Yet still, the current doctrine continues to prescribe

deployments in which our units operate side-by- side with other similar formations, covering their flanks. The reality is that these additional units simply no longer exist.

The most logical solution would be to "rethink" our current doctrine, trying to return in a certain way to the solution existing before 1914. Until that date, the units deployed securing their own flanks and rear, without counting on other units taking on that role. However, this solution presents complex problems: all these "soft" elements that are supposed to deploy behind the front may be forced to "harden" (probably changing their organization materials), while it will also be necessary to improve the "self-sustainment" of the units (to survive a possible cut of lines of communication that will no longer run through "safe" territory). In addition, for example, Spain follows the NATO doctrine. Therefore, the adoption of such a significant doctrinal change is not simple, but requires consensus among all allies, and the support of the United States (who, having the largest Army of the Alliance, is the least affected by this problem: the U.S. Army is almost the only one capable of constituting a front by itself, albeit of small dimensions, while its means - current and future - allow it to considerably expand the area of action of their units).

In addition to the small size of the armies another fundamental factor is the lack of reserves. Western armies, in addition to being small, can barely grow (again with the exception —partial— of the U.S. Army). The disappearance of conscription means that many countries do not have reserves with a minimum level of training, another additional and linked problem is the long timescale required to obtain new materials to equip these reserves or to replace losses. Indeed nowadays, the production of military equipment and armaments implies very long timelines (the supply of advanced weapons systems - tanks, helicopters, howitzers, missiles etc. requires months or years). As a result, in the event of a high-intensity conflict, armies will be losing capabilities progressively because of personnel and material losses, with no immediate replacements possible. In case of a protracted or very lethal conflict, the armies may completely lose their combat capability. As the conflict drags on, these losses will only increase, with little chance of being compensated. And what has not changed is that the loss of the fighting capacity of the armed forces implies defeat.

Like almost everything in history, this situation is not new. During the eighteenth-century armies were also "professional" (composed mostly of foreign mercenaries, in fact), states had few reserves, and the training of troops to fight with the doctrine

of the time was complex. For example, the Prussians estimated that they needed two years of instruction to have a trained infantryman. As a result, in some respects the situation was like the current one: once the war started, the armies were progressively reduced. The strategists of the time made a choice which was the result of this situation: to avoid combat at all costs. Certainly, a major battle could be "decisive"... for better or for worse, and since the loss of the Army was very difficult to compensate, the risk of these battles was extremely high. The whole of the 18th century is a succession of limited sieges, marches, and counter-marches to threaten vital points, and battles that only happened when superiority was sufficient to ensure victory and they were not always accepted, choosing the weakest adversary for a prudent retreat. Centuries ago, Sun-Tzu already stated that "a general can spend his whole life making war, without being forced to fight a single battle". This same reluctance to wager everything in a decisive battle can be seen in the writings of Maurice of Saxony, of Frederick the Great of Prussia,[10] or even in those of the Duke of Alba,[11] who significantly, also commanded a professional army. In practice, in the absence of effective intelligence, it was very difficult to detect the movements of enemy troops, which favoured rapid manoeuvres that allowed surprise. The objective of a good strategist of the time was to manoeuvre with his Army in the most discreet way possible until he was in that position of advantage, making use of all kinds of stratagems to hide his movements or confuse his enemy over them.

The size of the armies of the time also did not permit the occupation by force of a rival State (except for the smallest ones), so the objectives of wars were necessarily limited. Victories and defeats had moderate effects, so they responded to cost/benefit calculations, a situation far from the "passion" that later characterized the Napoleonic Wars. Therefore, if the Armies managed to cause enough damage to the enemy (depleting its economy, occupying a province), agreement was usually reached.

This situation of small and hardly replaceable armies is not different in essence from the current one, so that, predictably, if future conflicts occur between advanced states, this aversion to the decisive battle will reappear, and with it a situation of "war limited", characterized, as in the 18th century by a moderate level of hostilities.[12] However, the possibilities of maneuvering to obtain an advantageous position will be much more limited, given the enormous development of the

intelligence means, which will almost the hidden movement of military means of a certain entity is impossible. As a consequence, the way these "moderate hostilities" are conducted will have to be different. However, as then, these small armies are unable to occupy a state of a certain size (as evidenced by the results of the invasions of Afghanistan in 2001 and Iraq in 2003). This fact, together with the presence of the nuclear weapon, removes the possibility of "total war" proposed by Clausewitz, and takes us back to the situation of "limited wars" with equally limited objectives, and based on rational cost / benefit calculations.

As a result, and as in the eighteenth century, armies must find a way to cause enough damage to the enemy so that he agrees to negotiate an advantageous agreement. If the decisive battle is out of the question, as risky, and the maneuver to reach an advantageous position is extremely difficult to achieve, the remaining chances of causing the enemy enough damage to force him to accept a deal are slim: a trade blockade (usually will be carried out by the Navy), or a "strategic" bombing campaign (to neutralize the enemy's command and control system, or to destroy industries and infrastructure critical to its economy) are the two most frequent options. However, both have difficulties: blockades require the enemy to have a high dependence on maritime trade, present legal problems and, in any case, historically they have not been particularly effective.[13] Aerial bombardments have problems that do not differ substantially from those Army: Air Forces are equally scarce and irreplaceable, and the proliferation of advanced air defenses makes these operations as risky for airmen as "decisive battles" for Army. In another vein, the effects of aerial bombardments have only been decisive (and this is debatable) [14] in the case of the NATO operation on Serbia on the occasion of the Kosovo crisis of 1999.[15] The results of an exclusively aerial action Even with success, they can be seen in the case of Libya, when the Gaddafi regime was overthrown in 2011, a situation that led the country into chaos that lasts to this day. Under these conditions, how are military operations going to be carried out?

The "Reconnaissance-Strike Systems" (RUK)

In the described situation it is interesting to recall the concept of RUK[16] (from the Russian рекогносцировочно-ударный комплекс), also called "RYK" or "ROK"[17] (when the concept is implemented in lower levels of military operations). This

concept was born from the Soviet analysis of the Yom Kippur war of 1973, when the modern systems of guided weapons provided by the Soviets to the Egyptians (mainly anti-aircraft and counterattack missiles) were on the verge of defeating the Israelis, and the great technological advances of the American "second offset strategy" of the 1980s.[18] In principle, the Soviet theorists used the concept to describe what they thought NATO was developing,[19] but soon they tried to implement these ideas, a project aborted by the demise of the Soviet Union.

The translation of RUK as "reconnaissance-strike complex" comes from the fact that it is based in the use of intelligence ("reconnaissance", at the time), to provide targets for long- range, precision weapons ("strike") in an automatized way ("complex" or "system"). The concept is born on the consideration that the advances in sensors meant that, for the first time in history, the battlefield could become "transparent"; everything present on the battlefield could be detected and located, quickly, and with sufficient precision.[20] In the same sense, the advances in guided weaponry meant that every detected target could be quickly engaged and destroyed. Consequently, the combination of advanced sensors and precision fires would dominate the battlefield, minimizing the role of manoeuvre.

The reconnaissance-strike complex is a joint concept, in the sense that it integrates all sensors and fires, irrespective of their Service of origin, in a single, centralized system (in fact, the Soviet Navy was the first service in fielding one of these complexes, using submarines —armed with cruise missiles and torpedoes—, guided-missiles escort ships, bombers and land-based missiles).[21] In their turn, the "ROK" is the same concept, but in a smaller scale, applied only in a purely tactical land environment.[22] In fact, the organization of the present Russian Mechanized Brigades[23] —rich in fires, air defence and EW— are very well adapted to this kind of combat, and they are introducing new weapon systems[24] improving their capability to survive in a combat environment dominated by these complexes.

For Soviet theorists this trend was inevitable, since these "complexes" were nothing more than a consequence of the unstoppable technological advancement, specifically in the fields of precision sensors and vectors for weapons, capabilities provided (among others) by modern UAVs. Thus, future combat would be played by rival reconnaissance-strike complexes, so that the most perfected of them

would end up beating the opponent.

As a result of this concept of combat, the reconnaissance-strike complex incorporates elements dedicated to degrading the effectiveness of its enemy's equivalent capability, and to protect its own vectors (EW directed against enemy sensors and CIS, including anti-satellite weapons, anti-aircraft defence to protect their own elements and facilities, and to prevent the operation of enemy airborne sensors and weapons). New equipment with ever-increasing ranges is in constant development (sensors, ground and naval fire vectors, and anti-aircraft weapons)[25].

In fact, combat against one of these complexes is a problem of fires, in which the range (of sensors and weapons) is the key element, together with the reaction time of the system (the time from which a target is detected until it is hit).

The original concept of these systems had no impact on mobility: in reality, the technology would allow for practically global ranges without the need to move the fire-producing media and their sensors more than is necessary to provide them with survivability. The relevance of the concept described lies in the fact that the now popular A2 / AD[26] are nothing more than the western name of the practical materialization of the theoretical RUK concept. In practice, the technological promises on which this doctrinal concept is based have only been partially fulfilled: while in the naval and air field technology allows the battlefield to be quasi-transparent, this has not happened in the land field., where, despite technological advances, there are still problems to locate all the elements present on the battlefield. Consequently, deployed systems of this type (A2 / AD in Western terminology) have focused on air and naval environments (South China Sea, Hormuz Strait).

In principle, they are conceived as a "bubble" within which the Armed Forces deploying the A2/AD can operate freely with its air, naval and ground assets, while making it very difficult (ideally preventing) the entry and permanence of hostile elements within it. This "bubble" can also be used as a safe haven from which to project air, naval or ground attacks against the enemy, taking refuge in it after executing them ("hit and run").

The effectiveness of these systems is based on four main factors: the range of their weapons (which must be greater than that of enemy weapons), their precision, their ability to neutralize enemy fires (degrading the adversary's ISTAR capacity,

deploying an effective defense anti-aircraft, moving continuously) and the speed of its «decision cycle» (which will be translated into the time that elapses between the detection of a target and the engagement on it, sensor-to-shooter-time). This time will be less and less, thanks to advances in AI, another of the fields in which progress seems guaranteed. In addition to this, the North American third offset strategy has an even greater impact on prioritizing technological development in these same areas (robotics, autonomous systems, miniaturization, artificial intelligence, big data, etc.), [27] which will further boost the capabilities of the sensors, the fire vectors and the means of operation of the entire system. In fact, the highest priority program in the U.S. Army, «project Convergence», seeks to shorten the time of the sequence sense, make sense, and decide (the first part of the sensor-to-shooter cycle) with the support of technological advances, in particular, shared databases (the "cloud") and Artificial Intelligence. In 2020, experiments in the "Convergence project" made it possible to beat targets around the minute, instead of tens of minutes, albeit in a highly controlled environment. The increasing attention that NATO devotes to the concept of targeting is another symptom of the renewed validity of the concept explained: in reality, the process of targeting is nothing more than the logical way to operate one of these systems. The conflicts in Libya and Nagorno-Karabakh are a modest (perhaps unintentional) attempt to set up an embryonic RUK. However, the basic premises on which the concept is based are even more valid now than in the distant 80s: technology grants today, more than ever, that everything present on the battlefield can be detected and located quickly, precisely enough to be swiftly destroyed with "smart" (and increasingly economical) weaponry. And, as has been said, the future seems likely to ensure that the technologies needed to apply this concept will only increase in their development.

In addition, the proliferation of anti-satellite (lethal or non-lethal) weapons and electronic warfare equipment (currently the most effective weapon against UAVs), increases the defensive and offensive capabilities of these RUKs. For all these reasons, the concept of RUK may also be more present than future, as the case of the Nagorno-Karabakh conflict seems to underline.

Some consequences and conclusions

As we have already mentioned, in the future that seems to be on the horizon, some

authors foresee a return to the "limited war" of the eighteenth century, with some important nuances[28]: on the one hand, conflicts will be short-lived, as international pressure, coupled with the limitations stemming from the reduced size of armies, will be powerful forces driving the end of ongoing conflicts (however, the conflicts in Syria, Iraq or Afghanistan seem to discredit this opinion). In this vision, armed conflicts will be focused on the rapid capture of some relevant slice of land, preferably by surprise, taking advantage of a careless adversary (any mistake could create a "window of opportunity"), to retain it (in the case of land of great economic or moral value) or of using it as a "bargaining chip" in future negotiations (probably imposed by the international community). If this vision becomes reality, "deterrence by denial"[29] (through the physical deployment of military forces in disputed areas) would take on added value.

In a different interpretation, it would return to a situation to that of the Cold War, when the hostilities would be conducted "by delegation", using "proxies" or covert actions (cyber- attacks, always, but also special operations, information operations). The function of deterrence does not imply that military capabilities can be neglected, since deterrence lies, inter alia, in warfighting capabilities and in the perception that the potential adversary has of them.[30]

Nevertheless, the results of the Nagorno-Karabakh conflict seem to confirm the hypothesis that the normalisation of guided weaponry in armies favours the offensive,[31] and thus provides an incentive for the attack. Combining the two previous proposals, the situation seems to favour rapid offensive actions, but limited in objective, seeking a favourable subsequent negotiation process.

In any case, if a conventional confrontation breaks out, the battlefield described in which two rival RUKs fight each other is not completely new. It is an evolution of the static fronts of the First World War. On those fronts, action happened only at night, because, during the day any movement immediately attracted enemy artillery fire. In the same way, snipers would appear, taking as a target any combatant who neglected their concealment, making it very difficult to conduct any activity that could be detected. The resulting battlefield, even in the absence of major battles, was extraordinarily lethal and demanding for soldiers. In this war, the elements needed to mount a RUK are deployed for the first time, albeit in an embryonic form: sensors, long-range fires, communication systems that link them,

and prioritization and coordination procedures that allow the fires to be directed.[32] It is not by chance that "targeting" was born in that conflict, and with procedures that are noticeably like those of today.

In fact, the recent fighting in Nagorno-Karabakh is a rudimentary application of the RUK concept using novel means, in this case, UAV, but the basic idea is the same one. Sensors and long-range precision fires, that begin their action with the suppression of the anti-aircraft defenses, and end by the destruction of the reserves, command posts and enemy combat units[33]. Technological advances in the fields of advanced sensors (day and night), long-range fire vectors (including armed UAVs), and automatic systems (Artificial Intelligence), that shorten the time between the detection of a target and the engagement of it, and the huge drop in price of many of these elements, bring closer the application of the RUK concept, and not necessarily exclusively by the Great Powers.

The way to conduct the cited "limited" hostilities to which the size of modern Armies leads us, will most likely be based in the forming of our own RUK (or "A2/AD"), with which the enemy will be harassed with long-range fires, using armed UAVs as vectors, missiles of various types, and long-range artillery. All these activities will be conducted from the security provided by a powerful anti-aircraft defence (and anti-ship, if applicable), and combat units charged with neutralizing (and, where appropriate, destroying) enemy combat forces. To be able to do this, these combat units must be able to move faster than the enemy RUK is able to locate and hit them. This scenario will imply a very mobile and demanding form of combat for soldiers at all levels: very quick decisions will be required (which inevitably will lead to the adoption at all levels of the "mission command" approach), to deal a very high operational tempo that will call for substantial physical endurance. Special Operations Forces will also play a crucial role in locating and/or destroying key elements of the opposing system. (communications nodes, command post, critical sensors).

In any case, high intensity combat will consist mainly of an exchange of "fires" (including in that term many offensive actions that today escape the combat function of that name) on a large scale. This will be done with our own vectors (armed UAVs, missiles, rockets, howitzers, attack rotary and fixed-wing assets, and by incursions of combat units, and the actions of Special Operations Forces, cyber-attacks, electronic warfare, information operations), these will all be protected by

robust air defence and combat units dedicated to providing security for these vectors and making rapid incursions when and where an enemy weakness is detected. If these incursions lead to the seizure of new pieces of ground, the coverage of our system will be extended to include the newly occupied area, and the battle will resume using similar procedures with the new configuration of the battlefield. In the aforementioned war of Yom Kippur, the Egyptian forces were able to fight the Israeli in favourable conditions inside the area protected by their own air defenses and deep fires. However, when the Egyptian forces moved into the Sinai, they did not redeploy forward their air defenses and fires, and they were easily destroyed by the Israeli. In turn, the Israeli used combat units to enter Egypt in order to destroy key elements of the Egyptian system (long-range missiles systems, mainly), before being able to defeat the main Egyptian forces.

All the elements of our own system must be very mobile; especially those of high value: command posts, communication nodes, long-range anti-aircraft weapon systems etc. because as it stands, no anti-aircraft defence in the world can prevent the impact of atmospheric ballistic missiles with terminal guidance (as evidenced by the destruction of the bridge over the Akari River by the Azeris in the Nagorno-Karabakh conflict,[34] using an Israeli ballistic missile LORA, with a probable circular error of 10 m),[35] implying that survival must be based on mobility, concealment (including the concealment of the "electronic signature")[36] and protection, when and where possible. When some of the troops and elements operate outside the area covered by our ownair defenses (combat units operating offensively, Special Operations Forces), the mobility and concealment requirements will be even more demanding.

This type of combat is a very attractive option for the political level, because, by controlling the "target lists", it will always be able to maintain political control of the fight (which does not always yield good results, as Robert McNamara's handling of the air campaign over North Vietnam showed),[37] however, the likely cost will be to unduly slow down the operational tempo of the system (by increasing the time between the detection and the engagement of targets), an aspect that can nullify the efficiency of the whole system, especially at the tactical level. In any case, for operational and strategic level objectives, political level involvement will always be necessary.

On another level, the use of these complexes, in principle, allows for a limited number of casualties in our own forces; no major battles are foreseen, although a sustained and moderate rate of casualties will be suffered. The figures of the comparative lownumbers between Armenians and Azeris (very favourable to the latter)[38] seem to support this thesis.

It is also an attractive option for the industry. This type of combat is essentially industrial and therefore requires major investments in the sectors responsible for producing these types of weapons, ammunitions, and sensors. These are also very expensive. While UAVs and their associated technologies have fallen in price, but this type of combat also requires modern and powerful anti-aircraft defenses (very expensive), advanced electronic warfare equipment (also very expensive), long-range fires, armed UAVs, missiles of various types, anti-satellite capabilities etc… all very expensive.

This future is perhaps closer than we imagine. The rise of "targeting" in NATO's military environments is a symptom, the fighting in Nagorno-Karabakh or Libya are others, but they are not the only ones: technological advances are concentrating precisely in the fields that enable the implementation of the RUK concept: sensors, precision weapons, and elements that streamline the link between the two and their decision cycle (such as Artificial Intelligence). Perhaps more than the future, we are talking about the present.

Final notes

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