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SLOVAK REPUBLIC

AFASTUD 2018

**THE 20th STUDENTS' INTERNATIONAL
CONFERENCE**

Communicating Across Cultures



**March 29 – 31, 2018
Brasov, Romania**

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“Henri Coandă” Air Force Academy Publishing House

ISSN, ISSN-L: 2360-0152

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ANTI-ACCESS/AREA DENIAL WARFARE A NEW COLD WAR?

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Abstract: *The year 2018 sees an international context full of growing political and military instability, as the position of United States of America, the Global Hegemon, becomes more and more eroded by the rise of nations such as China, Iran or Russia. The unipolarity represented by the USA since the end of the Cold War is threatened by these growing economies and militaries and this calls for action from the former if the current balance of power is to be maintained. Being the world's best military power is no longer a fact that USA can take as granted, not only because the gaps between them and their closest competitors close at an alarming rate, but also because a new trend of warfare seems to dictate future state-to-state conflicts. The dawn of the 21st century presents the Anti-Access doctrine as the most likely form of warfare which could be employed in future state-to-state conflicts and it foreshadows its development to counter the advantages which the USA has as the world's still leading military power and also to limit the NATO's or other military blocks' capability to project power. The present study gives a briefly insight on Anti-access warfare, its strategic goals, the weapons which could be used and will look into China's anti-access strategy to try and define the concept, while focusing on Russia, which is a more likely threat to most members of NATO, albeit not to the United States.*

Keywords: *anti-access, military strategy, future, NATO, air force, missile, informational warfare*

1. INTRODUCTION: COLD WAR AND POST-COLD WAR MILITARY STRATEGY

The cold war gave birth to the development of new military doctrines influenced by the appearance of nuclear weapons. The leading military powers, namely USA and the Soviet Union, firstly regarded the FIRST STRIKE also known as COUNTERFORCE strategy as being the best way to deter and win a conflict. It simply stated that the first one to launch a saturation nuclear attack with overwhelming force against the other's own nuclear missile launch sites, silos, etc would win and enforce his peace conditions. The further development of nuclear weaponry brought into light the SECOND STRIKE doctrine which guaranteed that even when hit first, a country could retaliate in an equal manner of destruction. Such capability was made possible by railway-car based and submarine launched nuclear warheads.

However, in the most likely case of a non-nuclear military engagement between NATO and the Soviet Union together with the Warsaw pact countries, the NATO militaries were in an obvious inferiority when facing the sheer numbers of the enemy. To solve this shortcoming, the western block would have employed the DELIBERATE ESCALATION: when the NATO forces would succumb under the Soviet attack, tactical nuclear weaponry would have been used only against military targets in order not to provoke a general nuclear response. The political alliances gave NATO the upper hand from the geography's point of view and gave birth to the flexible response strategy.

Although a new strategic perspective, the flexible response implemented by president Kennedy also relied on mutual assured destruction by the use of nuclear weapons in what is known as the strategic triad (ICBMs, SLBMs and bombers). The flexible response would later have its operational part replaced by the Air- Land battle. This was made possible by the introduction of smart weapons like ATGMs and other precision-guided munitions which convinced NATO's leaders that a conventional war in Europe was winnable. The collapse of the Soviet Union and Warsaw pact highlighted the now fading threat of nuclear weapons and the emerge of a new stage in conventional military doctrines marked by great forward leaps in weapons technology.

The year 1991 is regarded together with its Desert Shield and Desert Storm operations as the start of the American world military domination. This process owed its beginning to the collapse of the Soviet Union and the utter defeat of the Iraqi Army which at that time was the fourth largest army in the world.

From a strictly military point of view, the success of Desert Storm proved the utmost importance of the Air Force as a weapon which could now singlehandedly win a war. The widely employment of smart munitions, cruise missiles, C4ISR and computer driven combat systems and Cross-Domain synergy proved to be the strongest element of the new kind of warfare generically named AirLand Battle. The expeditionary force of the USA, namely the carrier task force, represents a key factor in explaining America's ability to enforce its will through military force all over the world, therefore the expeditionary forces are supposed to wage war in a similar manner to the AirLand battle, but called AirSea battle since it is meant to be used at great distances and by seaborne units.

2. THE CURRENT STRATEGIC AND GEOPOLITICAL CONTEXT

2.1. Post Desert Storm assessment

After the stunning defeat of Iraq, the military leaders of the world, but especially those of Russia and China had to face the dreadful truth: the military arm of NATO, led by USA, could no longer be defeated in a conventional warfare and, due to the growing capability of NATO to project power, their nuclear arsenals also found themselves in a weakened position. During the nineties, with its economy and society crumbling, Russia still could deter any hostile action with its huge nuclear arsenal, but it came to China, the fastest growing economy in the world, to try and challenge the hegemony of the western world.

2.2. China's policy

China finds itself in the weird position of being one of the largest exporters of USA and at the same time one of their most likely future military adversaries. The regional American allies like Japan and Australia, together with smaller actors like Indonesia, Thailand, Philippines and Singapore are facing a political and military context full of tensions as they have to put in balance the advantages and disadvantages given by the growing of neighbouring China and the security guarantees made by the United States in the what appears to be a race between both superpowers for the supremacy in the region.

In this matter, China's strategy for USA relies heavily on its economic strength and on a basis of containment and engagement which seeks to win this confrontation in a peaceful way. This strategy should not come as a surprise given the Chinese economic assets which are second to none and, in a world characterized by the highest levels of connectedness, they prove to be superior when compared to the military arm of policy. However, the growth of China has not passed unnoticed and it becomes more and more to be seen as a threat by its neighbors and therefore by the United States, whose economy relies to a great extent on Chinese merchandise and its cheap labor workforce.

China's strategic objectives are to become the Hegemon of the south-east Asia in the first phase and in the second phase to impose a bipolarity in the international relations, represented by them and the USA in the world's political arena. The emergence of this not so new threat has provoked the pivot of the American policies from the Middle East to the South-East Asia region where the power balance seems to be at this moment in China's hands. This position of economic power is also backed by a growing military equipped with latest tech weaponry which is forecasted to even be able to compete with the American armed forces in the near future. In the middle of this strategy lies the anti-access strategy enforced by China in order to counter the upper hand which the United States still seem to have, albeit for not much longer.

2.3. Russian response

After 1991, the same transition from nuclear deterrence to anti-access capabilities can also be observed in the development of the Russian Armed Forces especially when talking about their SAM technology, full spectrum warfare capabilities and their means of waging asymmetrical warfare which seeks to slam the door on the NATO Air Force and all allied quick reaction forces.

In the post-cold war era, the NATO's interests shifted from Russia to Yugoslavia and later to the Middle East, but in the recent years Russia started to again show its teeth. Their attempts to overcome the military advantages of NATO and to weaken the Alliance are obvious and the 2014 situation in Ukraine, the Russian intervention in the Syrian Civil War and ultimately the growing distancing of Turkey from Europe and United States, give NATO militaries a glance at the upcoming threats coming from the eastern part of Europe. As for the objectives of the Russian strategy for Europe, we can tell that the most important objective for Russia is to maintain and improve its position as a super power as well as expanding its influence in the near abroad. The irredentist aspirations have already made themselves felt in Ukraine and for what NATO can tell, is unlikely that they will stop there. Russia seeks to obtain key naval facilities in the Black and Mediterranean Seas, Crimea for the former and Syria for the latter. This ultimate objective lies behind the intervention in Donbass in 2014 which directly threatens the south-eastern flank of NATO, already weakened by the alienation of Turkey. At the same time, the Russian support for Assad and their military presence in Syria put them in the position to have firstly an important military presence in the Middle East and in the Mediterranean and secondly, to sit at the same table with other great powers in negotiating a peaceful solution to the Syrian Civil War. In Europe, beside Ukraine, the deployment of the S-300/400 system and Iskander missiles in Kaliningrad cannot pass unobserved and this move is not only a part of Moscow's intent to reassure its great power position but also to improve the anti-access network that protects its interests in eastern and southern Europe.

Having briefly assessed the present military and political status quo in Eastern Europe and South-East Asia as well as the interests of China and Russia regarding the global hegemony, we can understand that the military supremacy of the United States of America is nearing its end as the most important mean to expand America's influence and as we will see in the next chapters, the most likely gravedigger of this military supremacy is the anti-access warfare because of its ability to neutralize key assets of the best military in the world.

3. ANTI-ACCESS WARFARE; GENERALITIES

3.1. Definition

Anti-access/area denial warfare, abbreviated as A2AD, represents the effort of a military to face the might of a more powerful aggressor by limiting or preventing the latter's ability to project power and operate military forces into, near or within a contested region. The first part, A2, refers to the means employed to stop or disrupt the deployment of enemy forces in the contested region, while the second one, the AD, refers to the actions taken to restrain and reduce the freedom of action of the enemy when he already is in the contested area. The objective of this strategy is to achieve some limited objectives and then defending them or to deter the action of any opponent by making any military conflict a very costly one for the attacker. The factors which influence the success of the anti-access warfare are considered to be the geography, the predominance of the marine domain, the criticality of information and intelligence, the extrinsic events and the strategic perception of the actors.

The utmost importance of geography and sea is self-evident: the main feature of A2AD is the anti-access part which seeks to stop any expeditionary force from entering the contested area as well as any follow-up forces and the ways to ensure such an attempt are deeply rooted into geography. By using the geographical features of the environment and most importantly the SLOC (Sea Lines Of Communications), the defender can stop the enemy response dead in its tracks, thus buying time to further reinforce its position until a more serious attempt is made by the attacker. The strategic perception of the actors plays a vital role, because A2AD is mostly regarded as a deterrence/defense strategy where the weaker nation acknowledges the superiority of the attacker and seeks to use all tactical and strategic measures to make an enemy attack either too costly for the attacker or unlikely to succeed. Thus, the starting point of the conflict is the strategic assessment of the enemy. Sun Tzu's lessons about deception and use of intelligence are still valid today as the high level of connectedness and the availability of information on a wide scale make the cyberspace the fourth dimension of warfare. Informational warfare is meant to deceive the enemy forces and to deny them critical intel, so it goes hand in hand with the last factor, the extrinsic events. The purpose of these events is to buy time for the defender and diverge the hostile forces in other directions and ultimately to weaken the attacker's will and ability to fight.

The A2AD is not a new strategy: it goes back to the Greco-Persian Wars, The Spanish Armada, Battle of Britain and the Japanese Campaign in World War 2, the Cold War, The Falkland War and many other conflicts. For the purpose of understanding, this study will briefly explain only the Battle of Britain together with the Cold war.

3.2. Battle of Britain

In 1940, The Battle of Britain saw the Germany's attempt to launch a seaborne and airborne invasion against England. It is worth mentioning that in the summer of 1940, Germany was the strategically superior force, while England was the last anti-Nazi redoubt in Europe facing the full might of the enemy.

The geography was simple and it played alongside the defender: the combat radius of the German fighters and bombers was not enough to guarantee an effective fight against RAF and the width of the English Channel was too big to launch a quick seaborne invasion and evade the superior British Navy, thus making the maritime domain a key part of the defense strategy. The informational warfare was waged by the English radar stations and observation posts which, together with the breaking of German Secret Communications Codes, rendered fruitless any German attempt to launch a surprise attack. The most important extrinsic event is the 1941 invasion of Russia which diverted all available re-

sources of Germany in the east. As for the objectives, England intended to survive long enough for the USA and Russia to join the war and it achieved this. Germany tried to avoid a war on two fronts and because of the defeat in the Battle for Britain, it failed to do so.

3.3 The Cold War

The Cold War is important because it emphasizes the use of A2AD at a huge scale, waged by and used against a superpower: the blue-water USA Navy which commanded the high seas facing the Russian Navy and its anti-access strategy.

Because of the NATO's ability to project power over the Atlantic, Russia aimed to deny the ocean to the American reinforcements which would have arrived over it, once the conventional war in Europe began. The Soviets' objective was to make the NATO leaders to face a horrible choice: either to lose Europe under the sheer numbers of the communist armies or to put their carrier strike groups in the harm's way in the Atlantic and the North Sea.

To counter the American carriers, URSS armed its naval forces with all the modern assets of an anti-access force: nuclear and diesel submarines, long range bombers, sophisticated naval mines as well as submarine, aircraft and silo launched ballistic missiles aimed at ships or other military targets.

Fortunately, the world didn't see the Third World War, but the deterrence of any NATO hostile move succeeded, so the Soviet strategy of anti-access was not fruitless. Other important historical events proved to be fatal for the Soviet Union, but their efforts in the A2 direction proved to be crucial in maintaining the balance of power. Toward the ending of the Cold War, USA managed to catch up and develop a strong and numerous Navy which could, at least in rhetoric, face the expected attrition in a conflict with the Soviets.

The Soviet way of waging warfare can be seen in the actual development, training and objectives of the armed forces which want to alter the present status quo, most important of which happen to be Russia and China.

4. THE IMPLEMENTATION OF A2AD IN THE CONTEMPORARY GEOPOLITICAL ARENA

Although the status of the USA as the leading military power is threatened by economic problems, political ones and the development of competitor armed forces, it still remains strong enough to deter other countries from launching any hostile actions against it or against its allies. As stated above, the year 1991 brought into light the seemingly undefeatable character of the American military and therefore, other rising powers started to develop and implement ways to counter this unfavorable balance.

Since the days of shock and awe following Desert Storm, states as Iran, Russia and China have not only greatly improved their influence in the politic life of the world but also, have succeeded to some extent to close the gaps between the USA military and theirs. Planning for the future has always been a difficult task resulting in a compromise between speculation and estimates based on a given set of information and perceptions. A famous quote reminds us that no plan ever survives the first contact with the enemy, so the following assessments and ideas are based on the most likely course of action in the future, but they are tributary, to some extent, to the unforeseeable character of history.

The next pages will present you with a brief insight into the Chinese anti-access capability and its forecasted strategy for its home region, followed by a more elaborate scheme of the Russian one.

4.1. The Great Wall of China

Having already described the actual state of affairs in the East-Asia in the Chapter 2.2, we can now shift our attention to the actual Chinese anti-access network. This will work in a classical manner praised by Sun Tzu, as the first purpose of the A2AD network in the region is to deter any intervention of the USA, thus achieving the supreme excellence of defeating the enemy without a fight. However, should this method fail, the People's Republic of China is quite ready to make full use of its military might, mainly as a deterrence force which could guarantee that China's continuous growth will proceed unchallenged.

The first important characteristic of the 21st century A2AD warfare is the cyberspace domain. It has been some time now since the use of precision guided munitions (PGMs) was preferred to the attrition with standard munitions which had to be employed in area-wide attacks. Even so, the actual context of networks after networks composed of high tech sensors foreshadows an even more dreadful approach of an attrition warfare with PGMs. In this aspect, it is already accepted that in this era of technology and speed, you have to try and blind or kill the archer, not the arrows, as they are useless without the archer firing and guiding them. We can therefore conclude that the anti-access force wants to employ on a wide scale its SAMs, anti-ship ballistic missiles (ASBM) and its coastal cruise missiles in an attempt to limit or impose a very costly success for the enemy aircraft and ships. Also, the use of the Air Force to mine critical Ocean straits and to repel any air or naval attack cannot be overemphasized and could be regarded as the second most important part of A2 efforts after the cyberspace capabilities. As of 2018, China seems to have a well-developed satellite and smart sensors network, albeit not as good as the American one. Despite of this shortcoming on the Chinese side, the use of electromagnetic pulse (EMP) weapons could render all enemy cyberspace networks useless. Here we can see the criticality of the informational warfare emphasized as one of the 5 factors which define the anti-access warfare. It helps to point out that the proper information and deception could either bring a whole carrier task group near China's doorstep or could see the entire naval formation succumb under a saturation attack with ballistic and cruise missiles as well as submarine launched weapons which could be able to overwhelm even the most advanced anti-missile shields like the Aegis System.

Another key factor of A2 is the strategic perception, but here we can assume that China still sees the USA as being strategic superior for the time being. Regarding the extrinsic events which could change the attacker's or defender's objectives, we can only say that their impact could vary, depending on the development of hostilities and the extent to which they affect the region and the entire world. Although the other factors play a vital role, the main feature of a war in South-East Asia is the geography, namely the maritime domain. Firstly, the distances to be covered by any counter anti-access force are huge and this makes the logistics alone a nightmare let alone the actual hostilities.

Secondly, the seemingly countless islands serve as an eventual base for the enemy defense network and this brings up the memories of the lengthy and bloody Pacific Campaign of the Second World War. Adding to that, the world's economy is based to a great extent on the commercial sea routes surrounding the region of conflict, especially the straits which are vital to the commerce and too easily to be mined or attacked. This will most certainly be an advantage for the defender and it will help him to enforce his anti-access capability and even render it too costly in lives, technology and economic/political problems to be penetrated, thus helping the defender to achieve its objectives using only the deterrence factor.

As a conclusion, in 2018 and the foreseeable future, China is building its policy and military development around the A2AD strategy, which seems, at least for the time being, to be the best way to achieve its national objectives in a peaceful manner or in a manner capable to win them a military conflict or, most likely, a favorable peace, if it comes to that.

4.2. The Russian way of warfare

Russia still has to recover its former glory and influence and has every intention to act in a peaceful, yet aggressive enough, manner against NATO. Having this purpose in mind, it is safe to assume that future Russian actions will take the form of nonkinetic “strikes” like political and economic pressure towards the West. The actions in Ukraine and most recently, in Syria, prove that the Russian military is still a force to be reckoned with, but not one to openly oppose NATO, hence the seemingly “peaceful” way. In particular, the case of the military intervention in Syria is not a difficult one to assess as this simply indicates the ambition of Russia to have an important naval facility in the Mediterranean Sea and to sit at the negotiating table, in the event of an international solution to the Syrian Civil War.

Ukraine, however, highlights a state-of-the-art implementation of asymmetrical warfare by the special forces of a nation and it’s likely that such methods shall be further used by Moscow.

The anti-access capability developed by Putin’s military has very few similarities with the Chinese one. While China seeks to deter or use attrition tactics in a probable war determined by its regional ambitions, Russia aims to achieve any objective in a peaceful way. This Russian peaceful way is by no means completely peaceful; it merely states that the Russian Armed Forces will not be committed into combat against NATO and this leaves the door open for asymmetrical warfare with the use of Special Forces, the exploitation of social unrest and economic or political pressure. In this context, the Russian Armed Forces will act as a latent military pressure against weaker states. According to its old ways to dominate Europe and ensure its defense, Russia wants to have a chain of fragile nations to act as buffer states or neighbors willing to accept a dependence toward Moscow. Such situations can be observed in Eastern Europe, in countries like Ukraine or Belarus, but are more observable in the Far East as countries like Kyrgyzstan and Tajikistan owe their development to Russian financial and political aids. This is obviously intended to limit and resist NATO’s influence in the said region in the same way used in Europe.

As we can see, Kremlin wants to employ the anti-access firstly as a political and economic way to deal with other states and only secondarily as a military capability. One of the most important advantages the Kremlin has, is the ethnic distribution of populations in Eastern Europe. As we have seen since 2014, under the umbrella of the right to self-determination, various Russian minorities can benefit from the military and political resources of Moscow. This represents more of a critical problem that the Russian military, because, unlike a military threat, it does not have a certain way to be countered.

The growing political instability in Europe perfectly fits the Russian intentions to separate certain states from the European way and direct them under Moscow’s protection. In consequence, the A2AD strategy seems to bear fruit as its political and economic arms attract or grasp nations while its military arm gives strong assurance that NATO’s response will be very limited.

To complete the picture of the Russian A2AD capability, we have to also take in the account the military assets and developments of its armed forces even if they represent a secondary ability to be used only if all others fail.

The Air Force has the T-50 fifth generation fighter under development as well as operational and combat proven fourth generation fighters. The Cold War long range bombers still pose a very serious threat as their recent routes around Europe force NATO nations to scramble their own fighters. The same cold war submarine force and nuclear arsenal put Russia in the panoply of great powers and compensate for its inability to possess high readiness troops similar to NATO.

The operational SAM networks are one of the best in the world fielding the S300/400 systems and are in a continuous growing. Even Turkey, a NATO member, recently purchased the S400 which serves to alienate the country even more from the common defense strategy of the Alliance. Although the invasion of Georgia in 2008 showed the lack of network-centered tactics, this is most likely to have already changed given the huge investments in satellite, C4ISR systems and ASAT technology. Slowly, the Russian military becomes more and more a real 21st century force capable to compare in some aspects with the USA and PRC.

In conclusion, Kremlin has so far used the A2AD capabilities it possesses with success and this means that NATO should really get a coherent strategy going to counter the Russian expanding influence. There is also the persistent fear that the Kremlin's efforts to portray NATO as an enemy may give birth to a Malvinas-type situation where the domestic failures of the government may use a conflict with NATO as a distraction for its populace and the first obvious consequence deriving from this is the urgent need to counter Moscow's policy before things go any worse.

5. CONCLUSIONS REGARDING THE A2AD USE IN THE FUTURE

5.1. The counter anti-access efforts

The most important part when talking about the A2AD and its countermeasures is to realize that the key factor in implementing or defeating such strategies is on full spectrum operations, that is the synergy between military, economy, policy and social environment.

Technology is not the sole answer and neither is the nuclear or conventional deterrence, but rather a combination of these with the political and economic relationships between countries. A denied area would mean, pretty much everywhere on the globe, a denied commercial sea route, a denied air space and other limitations which will not only affect the belligerents but also many other nations around the world.

A key factor mentioned above is the cyberspace warfare, but such a warfare would surely affect whole networks of information beside the one intended by the Anti-access force or by the attacker, thus making the conflict an even larger one and, in consequence, any A2AD driven warfare would affect many more countries and non-state actors than firstly expected.

In a final attempt to define the importance of A2AD in the future conflicts, I will overemphasize the fact that the ultimate objective of these tactics and strategies is to keep the enemy out of one's business through deterrence or other means and doing nothing to counter these efforts simply means to hand over the victory to the enemy without a fight.

The starting point of all counter anti-access strategy should be the old Chinese stratagem to "Cross the sea without heaven's knowledge" and Sam Tangredi, in his book, "Anti-access warfare" puts it in a more appropriate way: "...blind the enemy's sensors and means of intelligence while moving joint forces in the region.". We can therefore conclude that the issues presented by A2AD must be on the objective agenda of any country determined to preserve its national security.

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Abstract: *Josef Pilsudski, Marshal and leader of Poland in interwar period, had once a dream. It was called Mieszymorze, better known as Intermarium (the Latin for "Between the Seas") and it was meant to be a belt of independent states between Baltic and Black Sea, with the main strategic purpose to counter German and Russian imperialism. Pilsudski's plan was not achieved in those times, but it isn't obsolete now. Actually, the post-communist countries that are now members of EU&NATO form a sort of Intermarium. We now face difficult times: EU's future is unclear, the American leader is questioning the importance of NATO and Russia is rising again. In such a context, this old idea could prove itself relevant for a strong Europe. This paper will discuss the origins of the concept and its applicability in nowadays' world.*

Keywords: *Intermarium, NATO, Europe, security, geopolitics;*

1. INTRODUCTION

Thucydides statement in History of Peloponnesian War "the strong do what they can and the weak suffer what they must" would have been only a sentence in a book if it had not been proved relevant to relations between states, all over the course of history. Actually, I believe this is the leitmotif of history. In other words, one has to be strong in order to be a subject, and not an object of what happens. If someone studies the past of the East-Central part of Europe, he will notice this pattern.

Taking a short look on Europe's map, plenty of states in the East can be observed. But they have not been there for so long and there may be a question of their survival in the future. This is because geopolitics shows us that borders have a short life in this part of the world. The answer to this question stands in Thucydides' words.

These states do not have a long history, but their people do. They were in this area long before the formation of the states. And because they were weak, they suffered what they had to: the foreign rule over their lands. In fact, this region was caught "*at the center of geopolitical fault lines - between the Ottoman, Habsburg and Russian empires, between Germany and Russia, and between East and West during the Cold War.*"[1] Therefore, this region is, in George Friedman's words, "*all about memories – never forgetting, never forgiving and pretending it doesn't matter anymore.*"[2] The collapse of the Soviet Union brought them what they wanted for centuries: freedom to self-rule and to follow every path they want. They have chosen NATO and EU, members of which they are now. It was believed that the end of Cold War was the *end of history*. This was not the case, because geography is important in East-Central Europe and because Thucydides' words have eternal applicability in geopolitics. Recent events in the close neighborhood of this region (such as Russian-Georgian War, or the annexation of Crimea by Russia) showed the importance given by Russia to power-politics.

The response should be given in terms of power, not in an aggressive and offensive way, but in a defensive one. To do so, I think that countries in the region must form a solid block, a sort of alliance of countries united by their desire of survival. NATO, with its article 5, offers them security, but this is not sufficient. In such a context, we can appeal to an old idea that I think is now more relevant than ever: Intermarium.

2. THE ORIGINS OF INTERMARIUM

Some scholars refer to the Intermarium as being “the space between the Black and Baltic Seas, which circumscribe it in the north and south, respectively.”[3] (For example, in geopolitical analysis of Stratfor and Geopolitical Futures, Intermarium is used as synonym to Central and Eastern Europe.) But the credit for this term goes to Josef Pilsudski, Marshal and leader of Poland in the interwar period, who understood that Germany and Russia/Soviet Union would not be weak forever [4] and so proposed a federation, formed by Lithuania, Poland and Ukraine, with the core mission to oppose German and Russian imperialism. This plan failed in the aftermath of the Polish-Soviet War (1919-1921). In addition, the plan was not backed by some Lithuanians and Ukrainians. They saw it as a threat to their newly established independence in the case of former, and to the aspirations for independence of latter's.

Nevertheless Pilsudski was not discouraged by his failure and extended this project into a broader one: a federation or an alliance of states between the Baltic and Black Seas: Finland, Baltic States, Poland, Czechoslovakia, Hungary, Romania, Yugoslavia. “Pilsudski knew from his own experience that geography is only destiny if you don't turn it to your advantage” [5] and so he envisioned a solid block of states in the East-Central Europe, that he called *Miedzymorze* (the Polish for “Between-the-Seas” or *Intermarium*, as we will refer to from now on).

Pilsudski's vision was a product of two factors: his family history and his own bloody experience.[6] He came from a family that held lands in nowadays' Lithuania, in the ages of Polish-Lithuanian Commonwealth, and he saved Warsaw from Soviet invasion in 1920, as commander of Polish forces. His idea of Intermarium would have been a “spiritual and territorial descendent”[7] of late medieval and early modern Kingdom of Poland and the Grand Duchy of Lithuania. This Commonwealth was established in 1386, by the marriage of Grand Duke of Lithuania Wladislaw Jagiello and the King (actually Queen) of Poland Jadwiga d'Anjou. The geopolitical imperative that stayed behind the personal union was the military threat posed by the aggressive Teutonic Knights.[8] “The Polish-Lithuanian state would exist for the next four centuries and ranked among Europe's great powers.”[9] Its decline came from within, with political figures abusing their liberty, which finally degenerated into anarchy.[10] This vacuum of power was filled by neighboring powers – Prussia, Austria and Russia, that partitioned the country at the end of 18th century.

Pilsudski was born in 1897, in the lands occupied by the Russian Empire. He fought for Polish independence that was finally gained after the First World War. And when this came true, he realized that being on your own might be more difficult that one would expect. Therefore Intermarium was proposed. “However, what Pilsudski really needed to see his vision realized was backing from the Western great powers”[11]. No great power, except for France, supported the Intermarium. France was in favor of a *sanitary cordon*, a system of political alliances that would block the spread of communism. Thus, it was established a series of alliances, such as Little Entente or Polish-Romanian alliance. Even so, the German and Soviet imperialism could not be stopped.

Intermarium never came to be, but if it had, “World War II may never have happened or could have played out in a different way.”[12]

3. EUROPE’S REALITY

The Intermarium project, as envisioned by Pilsudski in the interwar period, was never implemented. In 1939, Poland was again partitioned by two powers – the German Reich and the Soviet Union. After the World War II, not only Poland, but all East-Central Europe had been caught in USSR’s sphere of influence for 45 years. Subsequently, the collapse of USSR meant the appearance of new states on Europe’s map.

The Baltic states, along with other post-communist countries (Poland, Romania, Bulgaria, Hungary, etc.) succeeded to join EU and NATO. As Robert Kaplan claimed, the incorporation of these countries in Euro-Atlantic structures is “the partial institutionalization of Pilsudski’s idea”[13]. No one should put in question the benefits that come from NATO&EU membership. But the recent events showed that these structures did not bring security to the entire European continent. The countries of East-Central Europe that are members of EU&NATO are only a part of the Intermarium region, and the other countries are not granted sufficient protection against Russian aggression, as seen in Georgia and Ukraine. Any further expansion of NATO&EU Eastwards seems now unrealistic and not practical.

Moreover, Stratfor states that the countries in the region can develop two strategies in order to be safe [14]: to maintain the U.S. engagement as much as possible and to create regional political and/or military alliances independent of NATO. The former is being realized through Missile Defense Systems, deployment of pre-positioned equipment and troops, and military exercises on Eastern Flank. But regarding the latter, the idea of a new Intermarium could prove itself as being more relevant than it was in interwar period. This may be “the only feasible solution for Ukraine’s and Georgia’s mounting security problem” [15].

4. THE NEW INTERMARIUM

When it comes to geopolitics, one must understand that there are two main factors to think about: the impersonal force of geography and the ideas, through which we try to turn the geography into an advantage. These ideas have their own dynamics, in order to keep their applicability in time. Therefore, a new Intermarium would take only the principle Pilsudski was thinking about – a solid block of independent states, and not all the details, such as borders, member states, structure, etc.

In this framework, a modern-day Intermarium would not imply a federation of states, as it has done in inter-war period, but “it could take the form of aid and single-purpose defense treaty signed by a group of countries that agree to assist each other in combating hybrid warfare activities conducted by foreign powers against them.”[16] Also, it is no longer the case to create a wall against German activities. Nowadays, the big national security problem of these countries is Russian Federation. “In the case of its implementation, Russia will be physically isolated from the West” [17] and deterred from attacking Intermarium member countries via traditional, hybrid, information, trade or other warfare.[18] Furthermore, it could prevent Russia from forming an alliance with Germany (which would be destructive, as the Ribbentrop-Molotov Pact was).

A problem that must be clarified is the proposed-Intermarium's composition. Defining its borders is the basic problem of the concept.[19] It can be extended significantly, in order to include a vast number of states, but there would appear questions of its viability. (For example, The Central European Initiative, a forum of regional cooperation between 18 countries, is mostly unknown, because it did not manage to impose any project). But it would be more practical to be compound by a small number of countries that do not want to *suffer what they must*. These countries could be: Estonia, Latvia, Lithuania, Poland, Slovakia, Romania, Bulgaria and non-NATO countries – Ukraine, Republic of Moldova, and Georgia.

To be a successful project, the new Intermarium must complete two needs. First of all, it must have a pivot, which will play the role of leader and will be followed by the others. And this is Poland. Actually, the Polish foreign policy has a permanent presence of thinking in terms of the Intermarium.[20] Recent events showed that the Law and Justice Party (PiS) loudly promoted the revival of Intermarium[21]. It was a line of reference for Lech Kaczynski's foreign policy. In fact, there is a hypothesis which claims that a sort of Intermarium appeared during the Russo-Georgian War in 2008, when presidents of Poland, Ukraine, Estonia, Lithuania and prime-minister of Latvia met in Tbilisi to show their support to Georgian people.[22] Moreover, the incumbent president of Poland, Andrzej Duda, stated: "I am thinking about the creation of the partner bloc starting from the Baltic Sea, and ending at the Black Sea – the Adriatic".[23] A concrete result of these is the creation of Lithuanian-Polish-Ukrainian Brigade (LITPOLUKRBRIG), a multinational brigade, that was officially established in 2016.[24]

Second, a new Intermarium needs foreign support. In other words, it needs American support, because one cannot rely on France and Germany when it comes to Russia, countries with their own national and economic interests. In the aftermath of 2014 events in Ukraine, George Friedman advocated for a new U.S. policy of containment against Russia: one that would "limit the development of Russia as a hegemonic power, while exposing the United States to limited and controlled risk"[25]. Friedman's idea is nothing more, but another definition to the Intermarium project. He also stated that "the Estonia-Azerbaijan line has as its primary interest retaining sovereignty in the face of Russian power. The rest of Europe is not in jeopardy, and these countries are not prepared to commit financial and military efforts to a problem they believe can be managed with little risk to them. Therefore, any American strategy must bypass NATO or at the very least create new structures to organize the region." [26]

As stated before, a new Intermarium would not be an offensive alliance, but even so, it is likely to be considered by Russia as a threat to its national interests. It is difficult to predict Moscow's reaction in case of Intermarium's formation. One would say that this is a classical security dilemma that leads to war, but Andreas Umland has another opinion: "Previous Western inaction and appeasement has not tamed the Kremlin's behaviour, while, on the contrary, decisive counter-action against Russian attacks has led Moscow to moderate its military activities." [27] This also reaffirms the need for a wall of countries in Central and Eastern Europe, united by their desire to *do what they can*.

5. CONCLUSIONS

In a world governed by power, the old concept of Intermarium could prove itself as being very relevant to Europe's safety. The reasons that support my assertion were presented in the body of this paper. The formation of a solid block in the Intermarium would not be easy at all, it would require time to strengthen the ties between these countries and it would face opposition, even from within. But with a powerful desire *to be strong* and with U.S. backing, the new Intermarium is not impossible.

The context for an Intermarium is now more favorable than it was in the interwar period. Pilsudski understood well the then-reality because he used Thucydides' logic, and so *his dream* was proposed. We can use the same logic again and turn his dream into reality.

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THE AIRPOWER OVER THE SOUTH ATLANTIC - THE ALKLANDS WAR

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***Abstract:** This study aims to focus exclusively on the general importance of airpower as a capability, while using The Falklands War as a case study, regardless of the well-known historical details and political context related to the conflict, and therefore to offer a clear understanding of the military backgrounds of both countries involved, the deployment of airpower on both sides and the challenges the British had to face in order to support a long-distance projection of power.*

***Keywords:** strategic military background, air superiority, airpower, air force, military conduct*

1. INTRODUCTION

The Falklands war was a ten-week war between Argentina and the United Kingdom over two British overseas territories in the South Atlantic: the Falkland Islands, and South Georgia and the South Sandwich Islands. It started on 2nd of April 1982 with the Argentinian forces invading the Falkland Islands and ended on the 14th June, 1982 with the Argentine surrender.

This conflict is a relevant example for explaining the importance of airpower in a military conflict, because it is about a small group of islands surrounded by a very large area of open ocean where the need for either naval or air support in order to gain military advantage is vital.

Securing air superiority is a must for the attacker before engaging into an amphibious operation to recapture an island defended by the enemy. The premises the study starts from are the thorough understanding of the military background of each country as far as airpower is concerned, since it has played a key role in determining victory and defeat.

2. EVALUATION OF THE TWO COUNTRIES' AIRPOWER CAPABILITIES

Argentina had few, if any, resources which could have been used against the British military, economic or industrial potential. In terms of strategic offense, Argentina had no potential to cause damage on strategic high value targets. As to what concerns a possible long range interdiction, Argentina did not have the resources to inflict damage on targets such as the second and third echelons of the British Task Force while in transit or on the unprotected refuelling tenders transiting from Ascension Island to resupply the Task Force. Neither was it able to attack Ascension Island which the British used as a staging base or the unprotected British and American tankers transporting fuel to Ascension for onward transmission to the Falklands.

The paramount factor in the Falklands conflict was that the Argentine military was unprepared and taken by surprise. Still, a few relevant remarks may be appropriate regarding traditional airpower missions: air supremacy, offensive air, air mobility, and combat support missions. None of these dimensions was truly able to provide air superiority to any significant degree, with the result that Argentina took heavy losses in aircraft and Britain in ships. In terms of offensive counter air, Argentina made a conscious decision not to engage the Harriers (The British used their Sea Harrier aircraft as the first means of securing air superiority. See Annex 1) after the initial aerial encounters on 1 May and thereafter limited its offensive actions to anti-shipping targets.

Defensive counter air preparations, including the maintenance of the air defence radar system and Mirage and Dagger aircraft (see Annex no. 1) at the ultimate "vital point" area - the mainland - took precedence. On the Falklands themselves, radars and surface-to-air missiles were deployed in this role, but no combat aircraft were sent to the islands. In terms of tactical offensive or offensive air support, Argentina's efforts at interdiction and close air support proved marginal at best. After the 15th of May British Commando strike on Pebble Island, which had destroyed 11 aircraft on the ground just prior to the British amphibious landing on West Falkland Island, the deployment of Argentine airpower in support of the land battle proved too weak and came too late. Once the British amphibious landing at San Carlos had taken place, Argentine flying was restricted, except for the Canberra high and low altitude night bombing attacks which proved to be of insignificant value. The few Pucara raids generated by replacement aircraft from the mainland were destroyed by British Blowpipes and Harriers. As a result, both Argentine battlefield interdiction and Argentine close air support can be deemed ineffective.

Argentina was most effective in the maritime strike role, in particular with the Exocet missile launched from the Super Etendard planes. Rather than sink the British Sheffield ship, early in the conflict, a more effective use of the five Exocet missiles available might have been directed at more profitable targets such as the "Hermes" (see Annex 1) and the "Invincible" ships, which were serving as British "airfields". The destruction of either carrier would have impacted heavily on the British war effort. The effectiveness of the Argentina's Skyhawk attack jets would have been devastating if the weapons delivery technique and bomb fusing had allowed for bomb detonation. But because of the very low delivery altitude and fuse setting, many of the bombs went through the ships or remained stuck in them without exploding.

Turning to Argentina's air mobility, the predominantly C-130 (Lockheed C-130H Hercules) air bridge to Port Stanley will remain one of the outstanding achievements in transport aviation and the war. It not only transported supplies to the Falklands after the MEZ (Maritime Exclusion Zone) was declared on the 12th of April, but even after the British Task Force's arrival on the 30th of April night flights continued regularly until the day before the war ended. Limited movement of Argentine troops on the island was done mostly by helicopter. Although combat support missions have low visibility, they are great force effectiveness multipliers. If Argentina had been able to access a continuous AWACS (Airborne Warning and Control System) platform, the combat losses it suffered would have been minimized. Aerial engagements could have been planned with full knowledge of carrier locations and Harrier dispositions at any given time. Argentina could have made better use of the force multiplier effect of air refuelling on the 1 May flying surge and to support the Skyhawk departure from the aircraft carrier '25 de Mayo' the next day.

Overall, it seemed like there was very little coordination in the planning stages between CANA (Argentine Naval Aviation Command) and the FAA (Argentinian Air Force), and it was mostly the exigencies of the war that brought them together to coordinate and cooperate over scarce air refuelling assets. Nevertheless, the KC-130H's tanker employed in the air refuelling role played a significant part in allowing the Skyhawks to carry out their missions with sufficient fuel to manoeuvre and engage afterburner in the target area, lessening concern over not having sufficient fuel to make it back to the Argentine mainland.

3. GIST

So what conclusions are to be drawn considering this brief analysis of the Falklands War as a particular event? It was surely a sort of a "come as you are war", but it was different from most similar conflicts in that it involved an unexpected enemy against which no long term preparations had been undertaken.

The high level of innovation and flexibility displayed by Argentina once the actual fighting began resulted in heavy British naval losses. However, the long range strategic planning and the resultant force structure were deficient; the only way that victory would have been achievable for Argentina would have been to sink the Hermes and the Invincible aircraft carriers. Initially using an out-dated ASW (Anti-submarine Warfare) platform and without the use of AWACS (Airborne Warning And Control System) and more numerous air refuelling resources, Argentina was forced to a difficult air campaign of flying sorties on out-dated information in aircraft with limited range. Unable to interdict British supply lines or to easily attack the Task Force, Argentina was on the defensive, and with the British controlling the sea - both on the surface and at sub-surface - Argentine troops involved in the Falklands were at a decided physical and psychological disadvantage.

The Argentine air staff executed a conservative air campaign given the limited resources, range limitations, and its strategy of preventing an air war of attrition. Its focus was mainly on protecting the Falklands - a limited objective - adopting the standard assumption that airpower would be the decisive factor in the conflict. With numerical superiority, they thought they could adopt a defensive approach, and therefore maintain the upper hand in the air once British land forces were committed on the island. However, airpower is but one integral part of warfare and must be seen in its correct perspective. Argentine sea power was trapped near the mainland and the Argentine land forces, isolated on the Falklands, made no effort to contest the British amphibious landing at San Carlos. A balanced approach to any conflict over a group of remote islands would have included sea control as a crucial element, heavily dependent on airpower not only for surface cover, but for sub-surface ASW (Anti-submarine warfare) work. This was definitely not the case with Argentina. Britain, on the other hand, had total control of the sea, and although the United Kingdom could not claim total air superiority over the Falklands, the British enjoyed a decided strategic advantage.

The Falklands War, as seen from an Argentinian perspective, is a modern day example indicating the requirement that air warfare be integrated and balanced with other military capabilities in order to achieve victory. Even though it is flexible and capable, the Argentine air campaign proved that airpower alone is not enough!

„Britain may have been forced to concede defeat if the issues involving technology, training and fuses have been slightly in Argentina's favor, and if Argentina had been able to sink just two or three more Royal Navy vessels.

Argentina had basic deficiencies related to the bombs its aircraft were using. If the accuracy of the bombs regarding their fuses had been just slightly improved, Britain would have probably been constrained to withdraw due to bigger casualties caused by Argentina's plane attacks against British ships.

Argentina had to face a problem which "afflicts many Third World armies, of concentrating on acquiring expensive technology rather than applying basic training and skills."

ANNEX 1



Chris Lofting - A IAI Dagger, <http://www.airliners.net/photo/Argentina---Air/Israel-Aircraft-Industries/0973075/L/>



Chris Lofting - <http://www.airliners.net/photo/Argentina---Air/Dassault-Mirage-III/0988439/L/>
Argentina Air Force Dassault Mirage IIIA



<http://www.iwmprints.org.uk/image/743172/campbell-alistair-la-a-sea-harrier-on-the-temporary-airstrip-constructed-at-san-carlos-on-the-falkland-islands-named-hms-sheathbill-june-1982>



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AIR POWER A PROTECTOR FOR MANKIND

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Abstract: *In this paper I will talk about the Air Power , a term which make a vital difference in nowadays conflicts. The Air Force component is an irreplaceable structure of the defense system . As the Air Force importance increase , a lot of people began to argue about Air Power role as a protector or threat . I will focus my attention on the Air Power as a Protector.*

Keywords: *Air Power, Air Force, Protector, Peace*

1. INTRODUCTION

“In order to assure an adequate national defense, it is necessary - and sufficient - to be in a position in case of war to conquer the command of the air.” Giulio Douhet

The Air Power is defined as the product of the Air Force. This definition result from the analyze over the last conflicts and the analyze of World War 2. The Air Force capabilities as the range of action , multi-role concept , the great fire power and the improved versatility give the Air Force the power to stand against any threat. The Air Power resumes this capabilities and express how the Air Force can protect in terms of power comparison between the forces.

2. AIR POWER HISTORY

In summer of the 1783 Montgolfier brothers managed to ascend their hot air balloon adding without realizing a new dimension to the war.

The potential of the new dimension was immediately set in the Battle of Fleurus in 1794, the balloons were introduced into the battle, this being probably the first use in the battle of an airplane. However, technological progress during the pioneering era was slow and for a considerable time the airships would remain at the level of "the eyes of the army." The end of the 19th century and the beginning of the 20th century were accompanied by a real explosion of theories, fictions and enthusiasm. Not in a few cases governments have decided to invest in the development of air means under the pressure of public opinion and air enthusiasts.

The detachment of the human being, the conquest of the airspace, the new mode of transport have inflamed people's imagination. At the same time, people have realized the new threat to their security by air. Partly this threat was fueled and exaggerated by fictional writings based on terrifying scenarios. The Germans were already perceived as possible aggressors in the near future for the states of Europe, and their success in the development of Zeppelin's airships sounded the alarm for all the governments of the states concerned and almost panicked public opinion, especially the United Kingdom.

Paradoxically, those very ephemeral airborne ships, extremely vulnerable and weather-dependent, have been able to pick up a load of hundreds of kilograms and a boring little speed, in other words with a potentially destructive, irrelevant potential, have had a tremendous psychological impact on public opinion and have produced a strong

response from it, compared to today's passive attitude towards the incomparably more dangerous potential of air vectors. This paradox might find its explanation in the fact that people understood the positive role of the air power for their security.

With the flight of the Wright brothers in 1903 in the United States of America and Santos Dumont, recognized as having flown first with a heavier aircraft than the air in Europe (although chronologically Traian Vuia departed from the earth before him), the road to the air power was open . In spite of the initial technological and organizational convictions of the air force, it became increasingly clear that, in order to protect a nation in the future and to ensure the necessary peace and security for the peace, it was "necessary and sufficient to be in a position which, in war case, to secure the conquest of air supremacy. " Air power, however, can't be built overnight, no matter how great political will may be at any given time; as such, states that have strong economic potential, develop and support air forces resulting in air power from peace. Experience has shown that air power manifests itself very much in this social state with considerable beneficial effects. In other words, the role of the Air Force Protector is constantly manifested.

3.AIR POWER IN TIME OF PEACE

1. Reconnaissance , surveillance and data collector

These missions are based on some of the characteristics of air power such as perspective, speed, omnipresence, which gives it a decisive advantage over other means by which these missions could be carried out.

The collection of research data precedes any possible operation either to maintain peace or war, regardless of its magnitude and is vital for planning and setting the targets.

Reconnaissance can be done both visually by each crew as a secondary mission or electronically with pre-operative aircraft and crew to update the tactical situation during or after the operation to analyze the effect on the target and planning subsequent missions.

Airspace surveillance by AWACS, E-2 Hawkeye or other types of E-3 aircraft has made it possible to impose interdicting zones and provide commanders with the necessary data for decisions in any peacekeeping operation or action of the actual fight.

2.The air power as a means of determination

• AGAINST THE POTENTIAL AIR ATTACKS

The strong Air Forces of a nation or alliance are the most effective deterrent for an enemy, after nuclear power, where air forces once again count as one of the main vectors. Air power does not necessarily require application. Its mere existence and the expression of the political will of its application proved to be sufficient, in many cases, to inhibit any hostile intentions.

• AGAINST AIR TERRORISM

Air power can act as a deterrent against terrorists who hijack airplanes and use hostage passengers as a bargaining object to achieve political ends. Security situations of this nature shock public opinion and common sense through cruelty, senselessness, and the general feeling of insecurity for people traveling on the air anywhere in the world for personal problems. The fact that they are still rare, however, is due, at least in part, to the understanding by potential terrorists of the risk faced by air forces around the globe capable of intercepting the hijacked planes to force them to land in an area under control of security forces and more recently, after September 11, even to break down if the hijacked plane becomes a threat to terrestrial targets.

Thus Air Force inhibits a possible threat only through its potential. However, when the threat is activated, air power must be applied in turn.

- **AGAINST THE CLANDESTINE AIR TRAFFIC**

Drug trafficking, smuggling or any other clandestine air transport can also contribute to creating a climate of insecurity at national or global level. Particularly in the case of drug trafficking it is tempting to cover large distances, among the main production sites and the main outlets, by air. However, as in the case of airplane hijackings, the mere existence of air power capable of detecting, intercepting and forcing landing in controlled areas at any time, or even in some circumstances legitimately justified by criminal aircraft, acts as a powerful inhibitor for any clandestine flight.

4. AIR POWER IN CASE OF HAZARDS

Speed and responsiveness make air power the most appropriate means of promptly responding to a natural or artificial disaster. The only possible impediment to a rapid international response could be of a political or formal nature. However, in the event of a serious natural disaster, even a state of political tension can no longer play a relevant role. Cases of natural disasters (earthquakes, floods, volcanic eruptions, droughts, fires) or artificial (accidents to chemical, biological or nuclear installations, humanitarian crises) were assisted by air, especially with specialized aircraft, research, surveillance, helicopters, nationally or internationally under the auspices of the United Nations in a combined effort with other non-governmental agencies or organizations, with air power proving to be a catalyst and an effort multiplier.

Search and rescue

Air power is used in search and rescue security situations, both in peace and war. In the last case, war, the constraints imposed by the enemy's actions have led to special, additional measures, and Search and Rescue (SAR) have become Combat Search and Rescue (CSAR).

Aircraft are too expensive to be purchased by the agencies and civilian organizations that need it. For this reason, all over the world, air forces allocate some of their resources, suitably prepared aircraft and crews, able to intervene at any moment to save people in dangerous situations, especially in hard-to-reach areas.

It would be an error that air power is not considered a positive influence factor on global security, not to mention the feeling of safety and comfort that every passenger who sails or sails anywhere in the world, knowing that there are forces ready to immediately intervenes to save him in case of danger.

5. AIR POWER IN HUMANITARIAN CRISIS

Humanitarian crises are one of the most common, painstaking and hardest to solve problems of contemporary society. Most often, they coincide with refugee cohorts that try to move away from the epicenter of the crisis. The mobilization of national and international bodies and the movement of resources and means involves calling to the air forces from the beginning and until the end of the humanitarian crisis. The range of missions carried out by the air forces includes aerial research, air transport, medical evacuation, rapid transport of troops protection and peacekeeping, and last but not least, air defense missions, with all that this is supposed, in situations where displaced refugees or already organized camps are in danger of attacking the air from the forces that caused the crisis humanitarian.

Without the application of this component of air power, humanitarian crises would take longer, would be tougher, in some situations it would not solve.

6. AIR POWER IN PEACE SUPPORT OPERATION

The characteristics of peacekeeping operations, in terms of air power, are a constant concern for avoiding collateral damage. On the one hand, they have a particularly strong impact on public opinion which, at least in the democratic countries, has an important role to play in supporting the effort required for peacekeeping operations. On the other hand, it is a very common practice that the belligerent parties, especially the one that caused the situation that led to the intervention of the international fora, should speculate this kind of sieges and place targets of military importance in populated areas, and in case of production collateral damage to artificially amplify their impact and magnitude, to present them as intentional attacks, while masking the real causes of the attack. However, due to intelligent weapons, efficient navigation systems, routing and control in the latest major conflicts, no damage has occurred relevant collateral. The role of airpower in protecting security objectives in peacekeeping operations is more than relevant.

7. CONCLUSION

The protector role of air power can not be disputed because it affects the state of peace at least to the extent that it influences the state of war. It makes longer and more stable peace by discouraging and inhibiting threats by avoiding or delaying the use of force until there is no other solution by maintaining peace or even imposing peace in conflict zones where non-intervention would lead to escalation and implicitly to war. Even under these circumstances, air power shortens armed conflict, discourages recourse to violence, and acts as an inhibitor of many global threats, excesses and other possible crises. Aircraft discourages or limits security threats such as air terror, clandestine air traffic , weapons, smuggling, etc.). It can also make the world safer by a quick search and rescue response, medical evacuation or disaster response and humanitarian crisis.

Therefore, air power can act as a factor for strengthening confidence and stability through its role of protector.

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DEVELOPMENT OF PAKISTANI NUCLEAR DEFENSE – REASONS AND DANGERS

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***Abstract:** This research looks at the reasons for developing nuclear weapons in Pakistan. It takes into account the history background and political instability. Understanding the problem of nuclear weapons in South Asian region requires understanding what happened to India in 1947. That is why the research mentions the establishment of the country. Moreover, how the situation in Afghanistan affected Pakistan's sudden interest in development of nuclear weapons. The article tries to examine why Pakistan is not necessarily mainstreamed and welcomed into a global nuclear order, but rather carefully examined. This research draws up upon scientific articles written about Pakistani military doctrine, Indian military doctrines and few books concerning the problem. The articles includes Pakistani nuclear doctrine and some critical thoughts of the author about it. It focuses on the dynamics and evolution of nuclear weapons in the country. There are few situations in Pakistani doctrine where the state would be able to use the nuclear weapon, and how the deterrence is conducted. At last, the problem of terrorism and developing nuclear weapons and dangers which it creates are examined.*

***Keywords:** Pakistan, India, nuclear weapon, terrorists, military doctrine, danger*

1. INTRODUCTION

To understand why a country like Pakistan desires to be a nuclear power it is important to know its history, which was not always so peaceful. Pakistan, a country located in South Asia, home for many extremists with an unstable situation all over itself. A place like this holds a nuclear weapon and is planning to grow stronger on an international arena.

Pakistan was established in 1947 as an effect of division of India into two states. On the beginning Pakistan had its two parts: Eastern and Western, one being now Bangladesh. The aim of the article is not to explain how either of the countries got their independence, but why Pakistan would aim to hold a nuclear weapon.

So, as mentioned Pakistan was created in the late 40s and at first was a frankly modern Muslim country, with a quite significant role in the international affairs; until the Taliban started to form their own leaderships in the Northern part of the country. Due to that fact and the war in Afghanistan it started to be dangerous and uncontrolled. Government of Pakistan was losing control over some cities, and the action taken against the Taliban usually resulted in a lot of civilian casualties. The number of attacks arose within Pakistan, especially in the North. The situation Kashmir (conflict with India) also had its impact on developing the nuclear strategy in Pakistan.

As the situation in the country was worsening and being less controlled, the Army was a different story. Pakistani Army is one of the biggest and the strongest, well-trained armies in the world. Despite the country being listed in the first 10 failed states, they are within the top 10 when it comes to the world militaries.

On the beginning Pakistan was hinting that it might possess a nuclear weapon, but its saber-rattling started at the end of the 20th century, when India exposed its nuclear strategy. Reasoning that they need to protect itself from one another. Nuclear weapon became a deterrence technique of the region.

2. PAKISTAN'S NUCLEAR DOCTRINE

Noticeable in the region of South Asia is the arms race, which has been continuing since at least 30 years already. Two main countries of interest are India and Pakistan, which as mentioned once were united. One of the first ideas and works over the nuclear project emerged in the last century, in the early 70s to specify. When Pakistan lost the war over West Pakistan[1]. Back then Pakistani Government decided starting an development of nuclear weapon. After these events, Pakistan was facing a supposed threat from a bigger and better-armed neighbor – India. Since both of the countries are enemies one tried to 'outscore' and overgrow another with the advantage of a stronger and better nuclear power. With the cold war at its peak, Pakistan and India saw two world powers deterring each other through inventing more deadly and dangerous weapons. The strategy of cold war was all about fearing one another, which seemed like an excellent idea for avoiding the conflict between two enemies in South Asia. Assuming the NATO-Warsaw Pact "war" was definitely motivating the arms race in the region. [2]

The war between two countries is many times referred to as a 'proxy war'[3], more than that scholars say that the war emerged at the certain time, which is the Soviet withdrawal from Afghanistan.

The reasons for that are:

- a) Showing off as the nuclear power in the region to defeat India,
- b) Holding an offensive proxy war to provide for retaliatory action of India,
- c) Balance of powers in the region
- d) Leverage to make USA, Europe, China involved financially.[4]

It seems important to mention that even though Pakistan built a nuclear weapon they have no doctrine of nuclear defense, at least they never published a document such as nuclear strategy of Pakistan. [5]However, three diplomats from Islamabad wrote an article concerning nuclear weapons in Pakistani strategy. One of which is considered a 'father' of nuclear power in Pakistan – Abdul Khan. Later on, officials of the country and the Army started to make public statements about it and that led to creating a proper nuclear strategy of Pakistan. The core of the doctrine was a statement that nuclear weapon in South Asia is a significant deterrence factor. Moreover, they stated that Pakistan does not necessarily need to follow "no first use" rule, which meant that Pakistan could use the nuclear weapon before India did in defense. [6]

Pakistan had three main assumptions:

- a) Deterrence
- b) Not applicable rule of 'no first use',
- c) Smaller arsenal of nuclear weapons than India.[9]

Interesting and scary part is that as a rule of 'no first use' does not apply in the case of Pakistan itself attacking or invading another country. The governors of the state pledged to never invade nor attack any state. [7]

Indeed, there is still some kind of mistrust and uncertainty between India and Pakistan. However Pakistan has already outnumbered India in the amount of nuclear warheads.[8] Thus, the rulers of the Islamic Republic of Pakistan are conscious of the fact that India has more potential and money to develop better and a bigger amount of the nuclear warheads.

3. NUCLEAR DYNAMICS OF PAKISTAN

The role of the nuclear weapon possession in Pakistan, as mentioned many times before, is deterrence. That should guarantee the immediate retaliation if necessary in case of any aggressive attacks against the government or people.[10] Moreover, for the state as the people it is a kind of assurance of safety. After all, no one is going to attack a country with nuclear weapon, because it may turn into an international nuclear crisis or even war. [11]

Today, Pakistan has the fastest growing nuclear stockpile in the world as it is able to produce over 200 warheads in the coming five years to ten years. Meaning, the Pakistan's arsenal would count around 350 warheads of nuclear weapons[12].

Pakistan being an epicenter of global jihadi terrorism has faced some tragic attacks on its defense structures in the past decade or even more. The devastating fact is that there are several examples where attacks were being held with help of the Pakistani military establishment. That was one of the reasons which led India to invent a so called "cold start," even though the Indian Army did not accept it as an official strategy for a long time. Although, Pakistan leadership believes that it is India's military doctrine and has shifted its own from strategic deterrence to full spectrum deterrence.[14]

Full spectrum deterrence means that Pakistan will try to adopt a nuclear first use policy as it is convinced that it is the most effective way to avoid conflict with India. Because they are both nuclear powers, they want to avoid a conventional war against each other. Pakistan believes that through making such policy Indian Army will be scared to even cross the border, which in fact will result in a lack of a bigger conflict.

Moreover, owning the tactical nuclear weapons is a way to end or de-escalate the engagement in the conflict. However, it is important to remember that just because this tactic was effective during the Cold War, does not mean that it will have the same effect nowadays. Although, usage of such weapons would have a negative influence and probably result in crisis in either of the countries involved as it would not be possible to move its population.

Pakistan's desire is to be mainstreamed into the world's nuclear order, but since their lack of a proper and realistic strategy to accomplish it. Thinking about current situation in Pakistan which means terrorist organization and some radicalization within the armed forces makes it even more difficult to accomplish this goal.

Pakistani nuclear arsenal is significant but Pakistan is aware that India has a more efficient production potential. India is able to produce about 270-300 nuclear warheads. Forasmuch, that India is still ahead of Pakistan when it comes to the numbers and quality of the weapons, the government of the country decided that there are few cases where is a possibility of usage of nuclear weapons:

- a) In case of an Indian army invading Pakistan,
- b) If there would be possibility of division of Pakistan with involvement of Indian forces,
- c) In case of the Indian forces damaging significant aviation infrastructure,
- d) Blockage of territorial waters
- e) Induction (by Indian armed forces) of a riot or taking action which would aim for destabilization of Pakistan.

4. TERRORISTS VS. NUCLEAR WEAPONS

When considered that Pakistan is a center of jihadi extremists and is a rising nuclear power it might come to one's mind that a terrorist can in some way access the deadly weapons. That would be a security "nightmare", because not only Pakistan or India would be in danger then, but probably most of the countries in the world. Such a situation is unlikely to happen, but services responsible for security in Pakistan had to consider such a scenario.

Considering the fact that over the past few years there have been several terrorist attacks on the facilities that supposedly store the nuclear weapons, it is important for the state to improve the security concerning nuclear weapons. However, Pakistan claims that there has been a significant improvement in the security environment over all, especially the nuclear security environment. There are no official reports which prove such information. It is important here to concern the fact that the Pakistani Army over the past few decades radicalized itself – meaning there can be "insiders". [15]

A collaboration between insiders and terrorist groups is the worst scenario for Pakistani security, taking into account the fact that there has already been such cases for example the attack on the naval base in Pakistan. In 2011 Ilyas Kashmiri, a man who belonged to 313 Brigade attacked the Mehran Naval Base close to Karachi. Moreover, since 2005 the Brigade has been acting like an extension of al-Qaeda. The participants of the unit are Pakistani Army officers who earlier worked for the Army. This contingent of alumni was working under the name suggested by Osama bin Laden "Jund al-Fida", which means Army of Martyrs.[16] There were several arrests in the past concerning alumni workers linked to the terrorist organizations or the mentioned unit. What is more significant here is the fact that due to the such battery of ex-army officers joining the group it was expected that the unit was able to get confidential information about the attacked airbase. The usage of past contacts those radicalization of some elements within the armed forces and knew who to recruit to al-Qaeda or TTP.[17] In 2014 there was a scandal revealing information about a deeply rooted nexus between radicals within the Army and terrorists.

Taking into consideration all of the above it does not seem impossible for the radical side in Pakistan to get a hold of nuclear weapons. There were cases where even middle or high rank officers were taken into arrest because of their links to a terrorist group. While for now, it remains safe, Pakistan took into account situations from the past and tries to make nuclear weapon information safer, but it is nearly impossible to track every single officer who is connected to terrorists.

5. CONCLUSION

Taking all of the above into consideration, Pakistan is a country with a strategic position in South Asia. Its neighbors are Iran, Afghanistan, China and India. The latter is its biggest enemy since the division of the country. Afghanistan consumed by war, Iran with a radical religious leadership, and India, who Pakistan is in conflict since the 50s of 20th century. The position of the country definitely requires a defense tactic which would cause the potential attacker lose more than they would gain. That is why Pakistan is focusing on creating a well-developed nuclear weapons and base their military strategy on that.

The events of cold war gave Pakistan and India the idea that being a nuclear power, will result in lack of a conventional conflict because either of the sides would not risk such a deadly damage which nuclear weapons cause.

It is hard not to agree with this point of view, however taking into account the situation in Pakistan. Meaning the development of terrorist groups over there, it seems such in the future a terrorist group might get into possession a dangerous weapon. Therefore, Pakistan has to develop a sufficient security for the nuclear warheads that they own.

Pakistan stated few situations where they will not hesitate to use nuclear technology (even though they pledged to 'no first use' policy) on their enemies for example: invasion of foreign forces, causing riots within the country, causing danger for the unity and independence for the state. Those are just few, but all are mainly addressed to India. Pakistani government is well aware of the Indian potential of building and storing weapons, so it needs a deterrence tactic without a 'no first use' policy in certain cases.

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THE INFORMATION WARFARE AND CYBERSPACE

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***Abstract:** The Information Warfare is a form of conflict specifically to the end of the 20th century and the beginning of the 21st century, which, through the conducted military operations, is a global instrument of strategic deterrence. Changing strategies, techniques and methods of warfare in all its development environments have been determined by this latest generation technology that has become part of all modern combat systems. It is considered to be the most developed form of war waged in cyberspace, through which the purpose is achieved without casualties or bloodshed. The way of planning and conducting military operations, especially the latter one, was irreversibly marked by the development of computer networks.*

***Keywords:** information warfare, military operations, combat systems, war, cyberspace.*

1. INTRODUCTION

A scientific approach to this new type of war was made even in the years of the Cold War, when the need for information made it possible to improve it on the basis of the impetuouos development of information technology. Identified and quantified in the middle of the 7th decade, the information warfare was officially recognized as a distinct type of war, as important as those on land, sea, air and space. This recognition is primarily determined by the understanding of the reality that mankind has entered the informational age. The technological revolution in the field of computers and communications has made the importance of information rising faster than before, which has led to its collection, processing, storage and dissemination on larger distances and to more users. In these conditions, it is understandable the growing concern that states give to the information warfare as a political war, as part of state policy, both for the promotion and for the protection of national interests.[1]

The information warfare is a conflict specifically to the informational age, developed by specialized structures, using smart intelligence systems, against certain targets and uses information as an offensive-defensive weapon based on deliberated principles, rules, strategies and methodologies in missions, attacks, companies or operations that seek to know, influence, dominate and control the attitudes, behaviors, actions, the will and the decisions of the opponent or the enemy.Regarding the use of information as an offensive-defensive weapon, it is deduced:

a) The **offensive** character implies the integration into a unitary conception of the information actions, initiated on the basis of a well-defined strategy, with clearly defined objectives and goals, aiming to obtain information supremacy, information and decision control or distorsion, destroying the information capacity of the target entity by using in its proper forms and modalities its own technical and informational capabilities.

b) The **defensive** character is implemented by the specific measures and actions taken by the affected/targeted entity to prevent, stop, mitigate, counteract the opponent’s information offensive.[7]

2. CYBERWARFARE AS COMPONENT PART OF THE INFORMATION WARFARE

The war has always been a reflection of its age. In the informational age, war will certainly imprint its features to distinguish it from previous periods. It is considered that cyberwarfare is the concept that most faithfully reflects the way in which military action will be organized and carried out in the informational age. The conduct of the military operations in accordance with the principles of information refers to the existing cyberwarfare in the military and intelligence fields. This is the attempt to know everything about an opponent while keeping your opponent not knowing too much about himself. Cyberwar is a virtual space conflict with means of technology and information, communication networks that seeks to influence decision-making, political leadership and the armed forces of the enemy in the theater of Computer Network Operations.[3]

3. STUDIES REGARDING CYBER ATTACKS

One of the first cyber attacks occurred in 1982 when a computer control system was stolen from a Canadian firm by some Soviet Union agents. Their mistake that time was that C.I.A managed to put a “logical bomb” in the taken device software. The so called “logical bomb” was in fact a group of code lines embedded in the programs. As soon as they attain some parameters they activate a malicious function. The aftermath of the case in question was an explosion of a gas pipe in Siberia. This was so huge that American satellites were able to detect it from the orbit. In spite of that fact, cyberwarfare didn’t attract too early the public’s attention.[8]

The “Moonlight Maze” case was a hacker operation in which hackers penetrated the american informatic systems so that they gained the acces level that could have threatened the state’s security. It is also one of the most important cybernetic infiltration, two-years-long, in which lot of military data were stolen.[8]

In april and may 2007, Estonia was the target of series of attacks that frozened government and corporations systems. Tracking back this “denial of service” attack and they have found that the origin of it was in Kremlin, Moscow, although Russia refused to admit it. Estonia was forced to ask for N.A.T.O. specialist’s help to remedy all the damages and after this experience they developed this branch so much that nowadays are housing the Cyber Defense Cooperation Center.[8]

Another interesting case of cyber attack was that from 2008, during the georgian-russian war waged in South Osetia. The outgoing web traffic was hardened, some governmental sites being transferred outside the country. However, the most dangerous outcome was that bank system was paralyzed, this conducting to the blocking of the mobile phone networks too.[8]

Regardless his power, even USA was one of Russia’s victims in matter of cyberwar, fact proved by the russian virus that penetrated one of the US Army secret networks. This was publicly acknowledged by Pentagon.[9]

Stuxnet is considered to be the cyber weapon that affected Iranian nuclear program. It is said, according to some sources, that Israel and USA developed a “worm”, released after that against the nuclear station Natanz equipment, through an infected USB stick. However, the virus was released on the internet short time later. Stuxnet was probably the most complex and ingenious informatic worm ever created. It managed to impress all the analysts from the cyber domain with the huge number of vulnerabilities that was able to exploit.

Stuxnet proved to be more efficient than a classic military attack because it is estimated to have delayed the Iranian nuclear program with approximately two years. Both Israel and USA refuse to acknowledge that the virus was the result of their collaboration, even if a cyber weapon of such complexity indicates the involvement of at least one government. The company Microsoft estimates that the virus is worth of 10 000 labour hours. According to an investigation led by New York Times, the sabotage project of the Iranian nuclear program was started by President Bush in January 2009, being accelerated under President Obama's mandate.[9]

4. PROTECTION OF MILITARY NETWORKS

Specific procedures and policies for what can be done and what can not be done on computers and social networks have been published by several DoD organizations. To protect personal information and reduce the risks associated with the online environment, different social networks have published instructions for doing so. To protect the units of which they belong, communities and families, anti-terrorist officers and army members should know and apply these rules. Social networking sites and other social media are popular with Army community members, their families, and friends for keeping in touch. These media are also an integral part of individual and organizational communications across the Army and the broader Department of Defense. The Army provides general precautions and recommendations for protecting its communities from the risks associated with the use of social networks. To create fear and anxiety amongst militaries, different groups of threats are trying to use our own personal information against us. Within military communities, we are responsible for protecting ourselves and others by reducing vulnerabilities by actively monitoring online information.[10]

Regarding the use of computer networks by military students, they make certain mistakes that could endanger them. You always have to think before posting. They are not aware that everyone will be able to see what they post even if the site limits their posts to friends and family. But there are problems associated with technology including smartphones and social media. Like any technology, these devices and services have unintended consequences and are subject to abuse and misuse. We need to study that, and the industry needs to think about how it can improve while the rest of us ponder our own use and potential policy changes. [4]

5. CONCLUSION

The Romanian military strategy considers that violent clashes will manifest on the battlefield in the information and advanced technology field, the war in all environments and the weight of the quantitative and energetic factors will diminish continuously in favor of the qualitative and informational ones. The success of Romanian's armed forces in a future military conflict will depend on: avoiding surprise, especially in the information field; ability to respond effectively; active cooperation with Allied Forces; timely activation of reserve forces; professionally carrying out unified operations; executing active defense; ensuring full force protection. [2]

Information and communication technology has evolved greatly and offers solutions to many of humanity's preoccupations and also to the military domain. It is obvious that technology is not the weak point of a system, but the organizational culture and the operational structure. For this reason, as far as the information war is concerned, technology offers solutions to all the theoretical challenges put forward by the initiators of its concept by military officials but cannot replace the human resource aspects. [6]

Global computerization of society can lead in the near future to the more intense use of the contemporary information weapon during the informational war.

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TECHNOLOGY EXCHANGE. ATTACK VS DEFENSE

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Over the past few decades, there has been a significant advancement in the field of technology and science. Although, there are some groups of people how belive that technology weapons will bring destruction upon earth. We could draw a reasonable conclusion only if we will analyse point by point the merits and demerits.

1. THE HISTORY OF TECHNOLOGY

From the etymological point of view, the term technology is a combination between these two Greek words: *technē*, which means art/craft along with *logos*, meaning word/speech. From the last century, due to the circumstances, the mean of technology shifts from a discourse above arts to an activity by which man seeks to change or manipulate his environment.

The branch of knowledge that deals with the creation and use of technical means and their interrelation with life, society and the environment, drawing upon such subjects as industrial arts engineering, applied science and pure science is called technology. Regardless of time and boundary, it helps provide information for the decision making process. Machinery can be explained based on education, business and economy, government, society and globalization.

Some say that without the improvements in this domain will lead to a slow economical development. Moreover it is expected to live a society stagnation for years. Although, there are three remarkable fields which prove the evolution: robotics, automation and computerization. We think that speaking about robotics will bring the strongest example to this argument. It is well known that the only thing computers can not imitate is our sophisticated, complicated, mysterious, perplexing brain. But will it always be that way? A German scientist, Hermann von Helmholtz, observed that our visual perception is stable, even if our eyes move three to four times a second. Sensoriomotor integration is a core principle of brain function, part of the intelligence algorithm that doesn't have an established area in the brain. Intelligent systems need to learn multidimensional models of the world.

In the Medieval period, technology was shown as a step back for evolution while other writers pointed to the church because they oppsed progress. Simultaneously military equipment was mainly developed: the armor was more efficient, cannons and catapults were invented. In terms of defense, many fortified castles have been built, marking this age, which is why it was considered the era of castles.

In the 14th-16th centuries, the scientific revolution has began. The printing press, invented by the German Johannes Gutenberg (1398-1468) was regarded as the most important event of the second millennium. The spread of information has been greatly facilitated by these inventions.

The communication cycle has just begun. In a manuscript from 1470 discovered in Italy, we find the first model of a parachute. Around 1485, Leonardo da Vinci in the Codex Atlanticus sketched a more effective parachute, being tested later in 1617 by Veranzio Fausto.

Between 1700-1950 the steam engine and the steam locomotive started the evolution process, ending with power generation based on the nuclear reactor. The computer has revolutionized the whole world, with applications in almost all areas. One of the most important inventions of the last century was the World Wide Web, in 1990.

2. TECHNOLOGY WEAPONS IN WORLD WARS

World War I represented a new stage in the military history of the world, thanks to the introduction of new technologies that changed the technique of war. From tanks to machine guns, radio and airplanes, from the establishment of blood banks to the introduction of sanitary napkins, this was a bridge between the industrial revolution of the XIX century and the modern age of the XX century. Among the most essential tools used in this conflict we count:

- The radio

Wireless radio was used for the first time in war in commanding armies and ships, however on the battlefield it took 12 people to carry a portable radio units. Thus, on the front, commanders used runners, dogs, pigeons or light signals to transmit information, while ships used flags and signaling lights to communicate when radio networks were overcrowded.

- Military medicine

This war was the first in which battles killed more people than illnesses. This was the result of better hygiene in soldiers' camps (including baths), cleaner water and the habit of periodically disinfecting the clothes. Furthermore, during the war, the blood banks appeared, so many soldiers could be saved due to transfusions. Then disposable sanitary napkins were first used by French nurses to stop the bleeding.

- Death tools

Some of the innovations introduced during the war have resulted in a much greater number of victims. Thus, the introduction of chemical weapons, the sapwood (so-called mustard gas), chlorine and phosgene has caused 1.3 million soldiers to be disfigured because of burns. The toxic gas was used by German, French, Italian, American and British armies. In addition, many soldiers have died due to the introduction of the machine gun.

- Military aviation

The airplane, this important invention of the 20th century, was first used in a war in the Italian-Lybian conflict of 1911, but it was only during the Great War that we could really speak of an aviation force. At first, the airplanes were more used in reconnaissance missions, but the fights between the aviators gradually gained ground and, although they did not decide the fate of the battles, the victories were important for raising the morale of the soldiers. Innovations in aviation during the war have made it possible in the interwar period to successfully develop a commercial aviation.

- Submarine

Army underwater vehicles date back to the XIX century, but only during this war Allies and Central Powers have developed modern submarines that could launch torpedoes for sinking ships. The battle rules (the warning of commercial ships before an attack) were ignored by the German fleet, which initiated total submarine war, sinking many commercial or civilian vessels.

The impact of technology on the physiognomy of war has been overwhelming in the period 1939-1945. The development of technical means of fighting has always been one of the key factors in the improvement of conflicts and in achieving success on the battlefield.

The modern struggle is largely influenced by the renewal and refinement of the material basis of the war, by the implications of new military technologies, all enclose interdependence with the profound changes in the general scientific field. Many of the achievements of science and technology have been used for the first time for military purposes, such as nuclear weapon, radiolocation, reactive propulsion etc. The branches of science whose violent development has decisively influenced the evolution of military art are: nuclear physics, chemistry, electronics, informatics but also biology, medicine or media technology etc.

World War II was the first large scale conflict where the following weapons came into operation:

- PPSH-41

Since the Winter War with Finland, in defending Stalingrad, Soviet troops were more likely to meet enemies at less distances than those that Mosin-Nagant's action guns have been designed for. The Russians needed a high fire rate from short distances, not precision or power. Here came the PPSH-41. A wonder of mass production, it was simple to manufacture (3000 per day) and easy to use. The efficiency of this weapon convinced the Russian army to equip whole regiments and divisions with it, fact which has not happened before.

- M1 Garand

One thing to increase the number of bullets a soldier could shoot against the enemy, the US Army put into operation one of the most famous weapons of all time, Garand M1. It was easy to use and maintained, and most importantly, it was quick when you had to recharge it. M1 became a veteran of the US Army and was in active service until 1963. Even today, several forces around the world use it as a drill ceremony and is regarded as a haunting weapon among civilians. On the other hand for the people who have plunged over the Germans, Italians and Japanese, it has often been the difference between life and death.

- Tanks

At first, the Germans build lightweight armored tanks, such as Panzer I, which was originally created to be used only for training. These light, but fast tanks, along with other armored vehicles, were the support for Blitzkrieg. During the war, all the forces in the conflict increased the fire power and armor of the tanks: Panzer I had only two machine guns, while the Panzer IV had a 75 mm cannon and weighed almost 20 tons. At the end of the war, the German tank Panther had a 75 mm fast cannon and weighed 45 tons.

- Planes

In 1940, the British began working on what they would call Rotabuggy. The project itself was an army jeep, equipped with a heavy propeller and a typical tail for an airplane. In 1943, the first experiments were considered satisfactory, after the car managed to rise from the ground, flying at a speed of about 100 km/h. The machine seems incredible today, but the British have invested time and money in a product they have never used. The idea of a vehicle capable of walking on land but also in the air was already too much, and the emergence of Hemilcar and Horsa II, specially built for the transport of cars, put dust on Rotabuggy. Those in the base of Manchester imagined the sky full of such jeeps, their occupants being able to use machine guns, grenades and other effective weapons.

The best of them: 1942- Focke-Wulf FW 190; 1943- P47 Thunderbolt; 1944- P51 Mustang; 1945- Messerschmitt Me 261 Adolfine.

- Radio technology

Based on detection and tracking, it evolved independently and secretly in a number of nations in the second half of the 1930s. at the beginning of the war in Europe, in september 1939, both the United Kingdom and Germany began implementing these systems. In the UK, this technology was called RDF (Range and Direction Finding), while in Germany the name Funkmessgerat (Radio, Measuring Device) was often used. Until the United Kingdom entered the war in mid-1940, the Royal Air Force (RAF) incorporated RDF stations as vital elements in the British Air Defense.

- Submarines

Submarine is a ship that has the possibility of mixed navigation, surface and immersion. The term designates military ships in particular for the purpose of camouflaging an attack. The main weapon used by submarines is a torpedo, a mini-submarine of 1,360 tons, capable of traveling about 4 km. The torpedo can carry 226 tons of TNT to either explode directly at the target hit or detonate by the influence of the magnetic field of the target body.

- Nuclear weapons

Nuclear weapons were used against humans only twice, that is, in 1945, around the end of the second World War when the United States threw a single atomic bomb with fission on the Japanese cities of Hiroshima and Nagasaki. Since then, over 2000 nuclear weapons have been detonated on Earth to test and demonstrate their purposes. In addition to their use as weapons, nuclear explosives have been tested and used for various non-military purposes. Thus, in the Soviet Union, they were used in mining and canal construction, minimizing their long term harmful effect.

3. MARIE CURIE

To understand the power of radioactivity, we began to analyse the work of a lifetime of Marie Curie, one of the best scientists of her time. She was a Polish-born physicist and chemist. After years of work, she manages to buy a train ticket Warsaw- Paris at age 24. In 1894, the Society for Encouragement of the National Industry in Paris contracted with Marie a study of the magnetic properties of various steels. At the end of 1897, the balance sheet of Marie Curie's activity is as follows: two licenses, the aggregation contest for secondary education, a study on the magnetization of the hardened steels. In the last years of the 19th century, the study of electrical discharge in rarefied gases had led to phenomena of phosphorescent and new radiation: cathode rays and Roetgen rays (X-rays). Marie Curie will prove that mysterious radiation is an atomic property, with the possibility that another body can have that power. The compounds of another body, the tori, emanate the same kind of rays. It denotes the *radioactivity* phenomenon, and bodies with this property are called radio elements. Examining some minerals, it finds an excessive radioactivity, containing a much stronger substance, an unknown chemical element.

Together with her husband, they will discover the existence of two distinct new bodies. In July 1898 they announced in Coruptes Rendus the discovery of the first substance extracted from pehblenda (a uranium ore) that became polonium (according of the country of origin). On December 26th 1898, the Curie spouses announced at the Paris Academy of Sciences the discovery of the second substance, called radium. The immediate goal is to get polonium and radium in pure condition. In 1902, Marie manages to prepare a pure radiogram, moment in which the existence of it is officially announced.

Radiation will be useful in medicine. Radiotherapy destroys diseased cells and cure certain form of cancer and has acquired the name Curietherapy. The Curie spouses have agreed not to patent their radiocommunication technique, although this could have brought immense material gains. It would have been contrary to the scientific spirit. Einstein said after the death of the scientist: *Mrs. Curie is the only one of all the famous beings that glory have failed to corrupt.*

For 35 years, Marie has been in contact with radiations produced by radios. For 4 years she was exposed to the radiation emitted by the Roetgen devices. She defies the fatigue and the diseases that crush her: the weaker vision, the rheumatism, the stinging of the ears. In June 1934, a disease, which at the first did not seem one to worry about, brings her death.

Remarkable facts about Marie Curie:

- She invented the term radioactivity
- She was the first woman in Europe to take her doctorate in science
- In 1903 she was the first woman to win the physics prize at the discovery of radioactivity
- In 1911 she became the first person to win the Nobel Prize for the second time (this time in chemistry) to discover and isolate the radio and its components
- She has received a total of 15 gold medals, 19 titles and other honors

4. NUCLEAR WEAPONS

70 years old. It has been so long since mankind has been acquainted with what could bring its end, the most powerful way of mass destruction: the nuclear weapon. Although, people have realized that possession and use of nuclear weapons mean, in fact, self-destruct and not supremacy, their realization and improvement continues.

At the beginning of the nuclear era, the United States was the only country hoping to hold the monopoly of this new weapon. But four years later, after the nuclear bomb was tested, in August 1945 on Japanese cities Hiroshima and Nagasaki, the Soviet Union also presented a similar acquisition. The countries that followed the example of the two great powers were: the United Kingdom in 1952, France in 1960 and China in 1964.

To limit the spread of nuclear weapons, on July 1st 1968 was opened for signature of the Nuclear Non-Proliferation Treaty. It was signed by 188 states, less by India, Pakistan, Israel and North Korea withdrew in 2003. At the time of conclusion of the Treaty, the United States and Russian stocks numbered tens of thousands. Since 1970, the two powers have negotiated a number of bilateral arms control agreements and initiatives that limit, and later, reduce the size of nuclear arsenals.

Five nuclear states

Officially, the states holding nuclear weapons are five: America, Russia, China, France and the United Kingdom. Although, the treaty legitimates their possession and public testing, it is established that they should not maintain and build such weapons constantly. Article six of the Treaty stipulates that each state must *continue the negotiations in good faith with regard to effective measures concerning the cessation of the nuclear arms race at an early date and nuclear disarmament.* However, the five continue to retain their nuclear forces. Russia and America keep thousand of warheads to be disassembled.

Rebels of the Nuclear Non-Proliferation Treaty

Three others states, which did not signed the Nuclear Non-Proliferation Treaty, namely India, Israel and Pakistan, are known to have nuclear weapons.

India tested the first weapon in 1974, arguing in front of the international community and public opinion that the goals are peaceful. In 1998, India and Pakistan publicly tested, together, some of the arsenal they had. On the other hand, Israel has never tested a weapon, nor does it recognize any of them, categorically refusing the status of the first country to bring nuclear weapons in the Middle East.

Another category of countries that, in the event of war, are entitled to the use of nuclear weapons are several NATO member states. These states take part in consultations and have a say in decision-making in terms of nuclear armament policy, they maintain the functional equipment necessary for the operation of weapons and keep nuclear weapons on their territory. In Europe, NATO member countries that host weapons of mass destruction are: Turkey, Netherlands, Germany, Italy and Belgium. There are about 180 of these bombs on the European continent, guarded by American soldiers.

5. HIROSHIMA & NAGASAKI

Nearly 73 years ago, for the first time mankind stood before one of the greatest nuclear disasters. On the morning of August 6 1945 at 08:15 it was launched by Americans *Little Boy*, the first atomic bomb in human history, above the sky of the Japanese city of Hiroshima. Which thus was shaved off the surface of the Earth.

Seven decades have elapsed since the Americans used the first atomic bomb in the history of mankind in Hiroshima. After three days, the same fate was to have the Japanese city of Nagasaki.

Hiroshima, the city with 1.2 million inhabitants is now once again a prosperous centre, but the physical and mental scars persist.

Little Boy was launched by American Aviation at 08:15 on board a B-29 bomber, nicknamed *Enola Gay*. The uranium-based nuclear bomb had a force equivalent to 600 tonnes of TNT. The huge atomic fungus rose up to 16 km above Hiroshima. It is estimated that 140 thousand people died of the time of impact and subsequently due to radiation.

The ground temperature has reached 4000 degrees, enough to melt any steel.

For survivors, the aftermath was an ordeal. New diseases beyond example until then, have marked them all. For fear not to be contagious, for a long time these *hibakusha* were isolated from the rest of the population.

The two nuclear bombs, from Hiroshima and Nagasaki were to lay down Imperial Japan and also end the Second World War.

Only three days had passed since the August 6 bomb, uranium bomb, has decimated Hiroshima. The Nagasaki bomb was launched in the midst of a considerable chaos and confusion in Tokyo, where the fascist military government searched for months away of honorably ending the war. This bomb was the second and final atomic weapon, which targeted civilian city.

Early on the morning of August 9 1945, a superfortress B-29, which was baptized *Bock's car*, took off from the island of Tinian in the South Pacific. The plutonium bomb on *Bock's car*, had the code name *Fat Man*, named after Winston Churchill.

The reality of what happened in Hiroshima has become hardly evident for the fascist military leaders in Tokyo. It took two-three days after Hiroshima was burned before the Supreme War Council of Japan was able to understand even partially what had happened there, to make rational decisions and to discuss the possibility of surrender again.

But it was already too late, because while the War Council was meeting that morning in Tokyo, *Bock's car* and the rest of the B-29 fleet were already approaching Japan-undetected by radar. The launch of the second bomb was originally planned for August 11, but it was forecasted by bad weather and the mission was moved on August 9.

At 11:02 a.m., during the morning service, the Christian community of Nagasaki was boiled, evaporated and charred into a burning radioactive fireball that exploded at 500 feet above the cathedral. On the ground lies the persecutor, the vibrant, surviving centre of Japanese Christianity.

The majority of americans-56% of those questioned- also consider today that the launch of atomic bombs was justified because, without bombs, hundreds of thousands if not millions of americans, would have lost their lives, attacking the land of Imperial Japan 73 years ago.

6. NEWS ABOUT NUCLEAR WEAPONS POSSESSION

The nuclear arms race is far from declining, although some states engaged after 1990 to destroy part of the arsenal. On the contrary, the development of this kind of weapon seems to matter more and more, especially after North Korea has announced that it has successfully tested an intercontinental ballistic missile that can carry nuclear warheads.

This last move by the North Koreans concerns the international community. In addition, the new American administration did not remain indebted-entitled its rhetoric against them. United States defence secretary warned North Korea that the United States *could launch an attack* if the situation escalates.

In December 2016, Vladimir Putin imposed on the heads of defense the strengthening of nuclear capacity, which must be a key objective of the country. Donald Trump immediately responded to Twitter saying that the United States would expand their nuclear capabilities at a fast pace.

This news that came from the main nuclear powers in the world are not cheerful. Already in the world arsenal there are atomic bombs that sum up a power of millions of kilotons. Moreover there are 15.000 nuclear warheads ready to be mounted on intercontinental missiles, most of them belonging to the United States and Russia.

In the possibility of a nuclear attack, it is estimated that a single B-83 bomb held by the United States would kill 1.4 million people in the first 24 hours with 3.7 being severely injured. The most powerful atomic bomb is held by Russia. If it were launched over New York, it would kill 7.6 million people and 3.7 million would be injured. Millions more would suffer severely over a distance of up to nearly 10 km around the affected area.

Not only the nations that officialy hold nuclear weapons are in this continuous conflict, but also Iran, whose president, Hassan Rouhani accused the United States of threatening Russia with new atomic weapons, after Washington published a report on United States nuclear policy in which are announced plans to modernise the atomic arsenal.

7. CONCLUSION

We would like to present the favorable facts of the nuclear weapons' existence, together with nuclear testing. It is always preferable to know if a country has nuclear power or not, and this becomes evident at the time of testing. In case of a conflict in which that country is involved, it is better to know whether or not it has the ability to build and use nuclear weapons than to find out during the conflict.

We believe in the equality between nations. If the great powers of the world hold such a big quantity of nuclear weapons, the other nations need to have nuclear power too, in terms of defense. In this way, the less powerful states will have a shield, a rhetoric vow that others will not attack them, due to their stock. Of course, the ideal is the non-proliferation of nuclear weapons. But we can not deny that some countries will not accept this condition very easily. Moreover, some countries like Iran or North Korea (which either are supposed to have already confirmed they have nuclear weapons technology) have already shown very aggressive tendencies towards neighboring countries.

To sum up, we think that from a scientific discovery- Marie Curie's radioactivity- the evolution of technology bring in the present a supreme military weapon. In our opinion, this is the real development of technology worth speaking about, taking into account the side effects on humanity. This spoiled world is led by politics, economy and by the army, therefore the research on nuclear weapons will evolve continuously, thing that will maintain the conflicts and tension among states.

WALKING THE ROAD OF EDUCATION UNDER GUN THREAT: CASE OF THE USA

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***Abstract:** In the wake of the latest events the United States society is in a dilemma. First, there is the constitutional right to own guns. Then, there is the right to life, liberty and the pursuit of happiness. It has to face the shame of being labeled as a world leader that is not able solve its own issues.*

***Keywords:** first keyword, second keyword, third keyword...*

1. INTRODUCTION

Are the massive school shootings part of the American existence? We seem to think so. Nowadays, we are wondering whether the American power is shadowed by this type of violence. H. Rap Brown, a political activist, once said that "Violence is a part of America's culture. It is as American as cherry pie". Perhaps no other form of violence can be so perfectly associated with America as gun violence and school shootings. School shootings, as defined, are attacks aimed at educational institutions, such as schools or universities, that involve the use of firearms. Society is dealing with a phenomenon which has sparked a controversial debate over gun control policies and the safety of the educational environment. These two are linked due to the US having one of the most liberal regulations for private gun ownership, which creates the context for children exposure to such horrible things. Every tragedy brings up new questions whether the measures taken by the government really work, and how they can be improved, but it never seems to make a big change. These typically premeditated attacks aimed at killing innocent people stand out as a huge concern, because the US seems to be the only country in the world where this happens so often.

It is commonly known that school shootings represent an American problem, especially since the early 2000s. The most obvious step in this whole process seems to be the challenge of reducing firearms availability, but this measure didn't seem to be taken into consideration over time. Moreover, in the response to the moral panic, government focused more on the liberty of gun ownership, rather than on the security of all society. This means that the measurements taken rather focused on more severe background checks, but loopholes still managed to exist.

During the first part of this paper we are going to deal with the legislative responses both in the United States and other countries from Europe, to the school shootings, in an attempt to understand the debates over gun control and age restrictions over gun ownership. This analysis mainly focuses on the social and psychological resorts of gun violence, mentioning some of the legislative responses meant to change the situation. In addition, we will discuss the lessons Europe learned from what happened in the past years and how it managed to make a safer environment for its own citizens. We are going to compare this situation with the endless number of bills proposed in the United States that did not seem to make a change.

This part also analyzes a part of Camelia Dumitriu's study about what reasons triggered the decision to commit an attack, focusing on 6 main factors identified in a group. The second part of the paper will bring into discussion the debate about arming teachers with guns, with arguments on both sides. In the third part we will discuss the moral panic and the impact of these type of events on the collective mentality. The paper ends with a personal opinion on the impact the school shootings had on the United States as an exceptional power and a world leader, and the consequences that followed the events.

2. SURVIVING EDUCATION: A TRANSNATIONAL COMPARISON

The latest events at Marjory Stoneman Douglas High School in Parkland, Florida call for an immediate review on gun control legislation. As a matter of fact, this discussion is not new; it is rather just one of the many tragedies that happened in the last few years, starting from Columbine, Virginia Tech or Jonesboro. The Columbine High School Massacre was one of the most publicized school shootings at the end of the 20th century. It involved two seniors, Eric Harris and Dylan Klebold, that had been planning the attack for over a year. During this time, they had built over 100 IEDs (improvised explosive devices) and had acquired various guns, using them to kill in 46-minute rampage 12 students, one teacher and themselves. Harris, who had just turned 18 prior the shooting, was eligible to purchase guns and rifles. After the Columbine shooting, the Gun Accountability Act was reintroduced within a month, followed by a separate bill that required background checks that was introduced in June. Unfortunately, none of the bills passed. Likewise, in the year following the shooting, over 800 bills were proposed, including the two mentioned above, but only 10% of them passed. To this day, the Columbine attack is remembered as a pointless and senseless murder, and the measures taken by the government don't seem to have significantly improved the situation.

Since 2000, there have been over 188 shootings in schools or universities all over the United States. Nowadays, we can say that mass shootings happen so often that they are no longer so surprising. Nearly 8 years after the Columbine shooting, the Virginia Tech Massacre was an example of the loopholes the American legislation had on guns and background checks. Seung-Hui Cho, a student that was previously diagnosed with selective mutism and major depression, showed increasingly hostile and threatening behavior against his classmates. Posing a threat both to himself but also to others, he refused to seek treatment voluntarily. However, Cho was not flagged when he tried to purchase his guns, and he even waited the 30-day period between gun purchases, passing the instant background check. In total, a thousand pieces of legislation were introduced following these events to prevent a tragedy, including the National Firearms Act and The Brady Handgun Violence Prevention Act.

The United States is known as the homeland of freedom and the pursuit of happiness, and for having the highest number of mass shootings in the world. The right of gun ownership is stated in the Second Amendment of the United States Constitution, amendment that gives every citizen the right to defend himself, but which is also the source of a huge controversy. Contrary to most beliefs, Europe had also been dealing with school shootings, but this became a high concern and measures were taken. For example, Germany, Finland and Scotland went through difficult times between 1996 and 2008, but that made Europe learn from past mistakes and prevent school shootings.

Discussing the prevalence of firearms, a study made by Adam Lankford on 171 countries found that there is a link between high firearm ownership rates and public mass shootings. Notably, Spain has one of the toughest laws on guns in Europe, having fewer arms per capita in comparison to France and Norway. The Constitution limits the gun ownership only for people whose job requires them or for self-defense and hunting. The United Kingdom is not far away from this. Guns are only permitted by meeting certain criteria. Even USA's northern neighbor, Canada, has restrictions on guns – making the ownership of a gun impossible without a license. There are 3 types of gun criteria – restricted, unrestricted and prohibited. In Singapore there may be one of the strictest laws in the world, the illegal use of weapon possible of being punished even by death. Australia might be the best example to support Adam Lankford's study. In 1996, after the Tasmania shooting known as 'The Port Arthur Massacre', the government tightened the legislation, banning all automatic and semi-automatic firearms. With a population of almost 8 million citizens, Switzerland has one of the highest ratios of guns per capita (45.7 guns per 100 residents). The only countries that have a higher ratio are the US (88.8 guns per 100 residents) and Yemen (54.8 guns per residents, but which also never had a single school shooting). There might be an explanation for this – in Switzerland, military service is mandatory, and the conscripts can keep their weapons at home even if they finish the service and go back to a non-military career. The background checks also take longer and are more rigorous than in the US, lasting even weeks long. Moreover, the citizens that are suspected likely to commit shootings are often approached by psychologists and authorities and are being forced to give up their weapon.

Psychological support is also important, and this is mainly shown through the psychological tests that are applied on all the citizens interested in owning a gun. For example, a standard practice in Germany is applying psychological tests for individuals under 25 years old who want to purchase firearms. Moreover, the age restrictions have been tightened and a database containing all firearms was built in 2013. Despite this, there have been many people who managed to illegally obtain weapons online, such as the 2016 right-wing shooter who killed 9 people in Munich's city center. With that in mind, we can say that no measure taken by the government can provide 100% safety for its citizens, because loopholes are inevitable.

There are various studies that focus on the reasons why the school shootings happened, arguing that they are rarely spontaneous and often planned, and they are triggered by many factors. Camelia Dumitriu has made a three-year research project funded by the Social Sciences and Humanities Research Council of Canada focusing on the school shootings from which she identified three distinct categories of school shooters. Moreover, 71 of the 163 school shooters she studied had no friends, experienced bullying and had difficulties developing relationships with girls. Despite this, 22 of them had normal relationships and were described as 'perfect students'. The third type that was over 30 years old represented the outsiders at school. The first group she studied (30 years or younger) shared six common characteristics.

Family issues was identified as one of the features, finding that in many cases, there has been a tense father-son relationship, often because the father has had a threatening behavior towards his children or even his spouse. On the other hand, many shooters grew up in middle-class families, with parents that were well-educated and had brilliant careers, keeping the family financially secure. The results of Dumitriu's study showed that the shooters did not have a history of mental illnesses. However, some of the school shooters used at some point of time drugs, steroids or stimulants, which can cause mood swings, violent behavior or suicidal thoughts.

Also, Dumitriu argues that religion and political views might play a bigger role in influencing the teenager's thinking than we might admit, highlighting a series of contrasts, all leading to extreme points of view, such as Nazi beliefs and obsession with Hitler's Mein Kampf. An issue regarding these US incidents is the gun culture and the easy access to guns, many of the shooters imitating soldiers, wearing military uniforms or accessories during the attacks. Dumitriu's study also showed that many of the shooters were linked to various organizations, including Boy Scouts or other military-emulating organizations. The study couldn't find a link between violent video games and the way school shooters viewed the world, but a series of ideas have been identified in their diaries or assignments, ideas that were developed in the late 1800s and early 1900s, among which we can find religious beliefs, Darwin's theory of evolution and the principles of natural selection, making several cultural traits common among these shooters. Dumitriu concluded that, although all school shooters from the group she studied had six common features, it is impossible to construct a precise profile.

Similarly, a study made by Friederike Sommer and Vincenz Leuschner focused on the conflicts that the perpetrators had at their schools, and how social dynamics influenced their behavior. The study highlights the interconnection of all social interactions, including bullying and peer rejection, conflicts with teachers, the perpetrators' social position and victimization/marginalization. In the cases analyzed, 88% of shooters experienced negative social interactions in their school environment, 85% fitted in the marginalization concept and 38% cited revenge as a motive for their crime.

3. GUNS AND TEACHERS

Lately, the decision to permit teachers to carry firearms has been a subject of debate, and of huge controversy. To achieve a realistic approach, both options, with their advantages and disadvantages, must be considered. In the wake of the latest school shooting in Florida that killed 17 people, President Donald Trump and the NRA (National Rifle Association) made a controversial proposal – to arm the teachers. During a listening session at the White House, Donald Trump met with the survivors of the latest school shooting in Florida, claiming that he will take into consideration the proposal to arm school teachers to prevent mass shootings, suggesting that some teachers should even receive gun training, so they can be armed in the classrooms. He supported his argument by saying that the only armed guard didn't try to enter the school to confront the shooter. During his 2016 campaign, Trump has been a supporter of the NRA (National Rifle Association) which militates for gun rights. On the other hand, the idea of giving weapons to teacher is not new because the NRA has been campaigning for this for quite a while. For example, NBA chief Wayne La Pierre thinks that the banks, airports or even the stadiums are more protected than children at school, suggesting that specially-trained teachers would solve the problems even before the police arrives. Greg Steube, the newly-elected State Senator, is an advocate for gun rights, saying that gun-free zones like schools might be easy targets for anyone who might try to commit an attack. He has proposed arming teachers that are specially trained or that have a military/law enforcement background. Moreover, he told The Associated Press: *“the most precious resources are our children. Why in the world are we going to put them in a circumstance where there is nobody that is armed and trained at any of our schools to be able to respond quickly to an active shooter situation?”*. Many people agree with Steube, but the teachers are divided on the issue.

In contrast, many researchers do not support this idea, and are saying that owning a gun increases dramatically the chance of injury/death, according to UCSF, a leading university dedicated to promoting health worldwide through research. Furthermore, the researches at UC San Francisco proved that having a gun makes someone three times more likely to commit suicide and twice as likely to become the victim of a homicide. The findings, based on 15 investigations relied on survey data to estimate gun ownership and focused on specific details, such as whether the victims had access to guns. Almost all the studies were done in the United States, which has the biggest rate of gun ownership in the world, causing over 31,000 deaths each year. Furthermore, those who are against arming teachers suggest that only people who are properly qualified should wield a firearm. Moreover, we cannot say that there is a big percentage of public school workforce in America or anywhere in the world that has extensive military background, contact with firearms or training, referring to what president Trump said.

Teachers Brittany Wheaton from Utah and Olivia Bertels from Kansas have started a touching movement on social media aimed to discourage arming and to let the world know what measures should really be taken to protect the schools. Sharing their personal thoughts on the issue, teachers started using the hashtag #ArmMeWith as a way of showing what they really need to ensure the proper education of students – school supplies, mental health funding, stronger gun control legislation and impactful changes in curriculum – and it went viral. The main goal is to allow teachers to come up with their own solutions to school shootings. These being said, many teachers across the country started reacting to President Trump’s proposal on their own, pointing to the lack of resources they are already facing. Bertels also said that many teachers are not interested in carrying a gun at school, adding that they already carry each day the burden that represents the lack of funding, support and resources.

Also, when we are talking about arming teachers, some factors concerning race must be considered, because there might be teachers of black students who have a racial bias or there might be black teachers or education workers who face their own risks of carrying a weapon. For instance, the shooting of Philando Castile, a cafeteria supervisor at a public school, is the best example of gun violence against black people. He was shot dead by a police officer after he told him he was carrying a licensed firearm – but this is not the only incident in the United States based on racism. This is the main concern for many black students, some of them having already faced verbal or even physical abuse over the years. The presence of a gun can make the relationship between a racist teacher and student more tense. On the other hand, this does not imply that every white teacher would use his/her gun against black students, but it does raise concern over how this problem can be managed regarding the protection of African-Americans.

4. MORAL RESISTANCE UNDER PRESSURE

According to Cohen Stanley, *moral panic* is the label placed on the reactions of the media and on the reactions of society as a whole, if pinned against youth disturbances. This begs for the question of whether the amount of reactions school shootings generate is just another way for a society to manifest itself when placed under pressure because of the emotions which are considered to be a `problem`. Burns and Crawford made use of the attributional model of moral panic to identify the Columbine High School shooting as the main actor who shall transform all future school shootings in inducers of moral panic. The relevancy of this fact is compelling for our research, since we noticed that the media could not help itself but to mention past attacks in the current tragical context.

Society was bombarded with news every time school shootings occurred. Pew Research Center demonstrated that more than a half of news airtime in 2007 was dedicated to Virginia Tech shootings. This proves the existence of a certain attention brought upon these events, which sadly is materialized mostly in news coverage. We addressed ourselves a question which seems to have a very shadowy answer, one that not many might be eager to accept or even discuss. We asked ourselves whether this exact exposure of a tragical subject, containing violence and scenes of extreme tragedy might become the cause of future episodes of this kind in the United States. Data from march 2001 shows that 64% of Americans believed that our way of approaching the subject matter is not that far off.

The degree of concern for such events is not the only cause identified by Burns and Crawford as being revelatory. They have identified also the presence of hostility, a component of moral panic, which can have a major negative impact on the generations educated in schools with a history of gun attacks. An example of hostility that students have to face after Columbine is the hatred towards youth dressed like the shooters and youth who enjoyed metal rock, punk and other such music genres.

If moral panic is thus proved as reality, we can blame the characteristics of the context as a bad omen for adopting pragmatic measures of prevention. This does not mean that the men of high power did not act with the best intentions in their minds. However, we can identify an intrinsic link between the mental state of the nation and these politics.

In order to analyze the fundament of this presumption, we must direct our attention to a series of controversial measures that, throughout the time, have attempted to decrease the phenomena of school shootings. Many of them are accused of being employed in a rush and determined by social fear. If this be the case, it is safe to assume that they are not to be a problem solver straight out of the box.

Back in the 90s, in the light of increasingly public fear that overwhelmed the public after several school shootings, such as those mentioned afore, the Gun Free School Act appeared to be a fundamental step for zero tolerance of weapons in schools. This can actually be considered a good example of a measure taken into consideration, an act which included laws that consisted of harsh punishments. Sadly, this ultimately has been proven to be unsupported by the Model Penal Code. The purpose of this initiative carried out by Senator Feinstein and Senator Dorgan was to offer “places where children escape the violence that engulfs so many of their lives”. But the most striking problem which interfered in this process was proven to be the inexistence of addressing rehabilitation. Also, the instruments of this law might have actually started a vicious circle, as the pressure of expulsion can amplify violent behavior.

Furthermore, there can be seen a various range of strategies meant to keep „the evil” out of schools, away from the students. Whether it is about armed police officers and school resource officers, metal detectors and access control points, they all fall under the category of security measures determined by overpublicized school shootings. These solutions should have been applied after a pragmatic analysis of empirical evidence. That did not happen, as it can be observed by taking a better look at solutions such as access control points and metal detectors. In fact, what seems to be an ignored detail is that school shooters are persons who have the actual right of gaining access inside the school, not outsiders. A very strong example can be stated as follows: in the case of the Columbine and Virginia Tech shootings, the criminals were students who studied there and had legitimate access inside the perimeter of the institutions. Unlike access control points, metal detectors may have had a relative success, as students could be less likely to bring weapons out of fear of being caught.

The problem with this measure is the high cost. That translates in a very low percentage of schools that use this strategy. Between 2013-2014, 8,7 % of high schools had metal detectors.

Schools resort to different strategies in order to prevent shootings. As we were able to see, prevention failed in a number of cases, thus the next obvious stage of action being the raising in awareness of the ways to deal with a situation like that. Students and school personnel have to learn one more thing in the US's schools: how to survive a school shooting. Generations of young people have experienced and will experience a new aspect of education: school as a survival camp.

In this context, drills are becoming a normality for a generation of American children that are supposed to follow an education under a perpetual fear of gun threats. Six states out of thirty-two, with laws about lockdown drills for students against intruders, made a step forward and imposed active school drills each year. As if this were not enough psychological pressure for the students, FBI suggested fighting the shooter, in a worse case scenario. We might imagine, for instance, a particular day in an American high-school for a student who might have to take part in a simulations involving the struggle for survival in front of a masked man with a plastic gun. Even though it is just an exercise, it can affect on a long term the general mentality of a whole generation thought to expect the worst. There is no need for any sort of psychological expertise in order to realize that, once violence managed to not be overcome, it will be used again. In addition, the National Association of School Psychologists studied the issue and confirmed that the „run, hide, fight” drills not conducted appropriately may cause harm to the evolution of schoolchildren. The problem which we believe that exists is the way in which such a an approach of distorting reality for a teenager or a young child can be understand in a lot of ways. For example, someone could make of it the path that leads to transforming the world into a more peaceful place.

Ever since the beginning of this chapter, an interesting approach of the subject of school shootings was how these tragic events have been taking place under the clout of a moral panic attack. Moral panic can be blamed, in some ways, for leading to the measures that in time failed to achieve their purpose. But, since school shootings are now perceived as a routine problem, with eight of these kind of attacks provoking severe injury or death as of this year, it can be observed that reactions created by the recent Florida shooting are not less intense than the ones created by the Sandy Hook Case, for example.

Using emotions appears to be handy, when we have a look at speeches linked to the unfortunate events. The best example that can be given is a present-day one, thus we may take a look upon how the US President, Donald Trump, addresses a nation in fear with an emotional speech line. A political study conducted by Cengiz Erisena și José D. Villalobos proves that speeches directly addressing the nations are the kind of presidential speeches most prone to including emotions, such as fear, fury and hope. The actual way in which the president addressed the nation after the Parkland school shooting made no exception.

Taking a step back, it must be mentioned that the opinions about the frequency of school shootings may vary. It is not an universal belief among Americans that school shootings are „the new normality” of education. There are strong arguments which allow us to consider schools as the safest environment for the young Americans, starting with the fact that there is a low number of shooting that have more than one victim and ending with surveys that demonstrate a higher risk for children to be victims of violence outside their schools.

5. AN UNNATtractive PICTURE

From the previous chapters we might remain with the idea that there are more and more Americans whom believe that schools are becoming an increasingly dangerous place because of all the school shootings happening. Along the same train of thought, we are eager to propose a subject that it is ought to be kept at the back of our heads throughout the rest of this paper and further research: the negative effect of mediatized school shootings in relations to the perception of societal security in the USA.

Societal security was first brought up by Barry Buzan in his approach to a theory regarding the nature of security, which was later reconceptualized in "Identity, Migration and the New Security Agenda in Europe". Social security refers to „the ability of a society to persist in its essential character under changing conditions and possible or actual threats". With using the syntagma „its essential character", the authors discussed the partake of two ideas: society's identity and social cohesion. But which are the elements that form the American identity and provide social cohesion over time?

The American Creed is a statement that can help us answer this question. It defines American identity and can provide an unique example of a nation which arose from a system of belief. This dogma includes the following principles: freedom, equality, justice and humanity. Those cannot exist without respecting the human rights, an ideal that emerged together with the creation of the state. This leads us to the United States Declaration of Independence, more accurately, to a well-known phrase, which is highly important in constructing our argument – „life, liberty and the pursuit of happiness". If the values we mentioned are core parts of the American identity, it means that all which threatens them is a threat to societal security.

“The pursuit of happiness” is a goal with many possible meanings. But one thing is sure and proven by the experience of totalitarianism and authoritarianism and that is the incompatibility between the happiness of a nation and the lack of human rights. So, the US society may be able to achieve happiness by removing threats to the basic human rights, one of which is the right to education. A famous supporter of the duty of this particular right in pursuing happiness was president Franklin Roosevelt, who announced the need for a second „bill of rights” as the first one did not lead to the destination of a nation in continuous search of happiness.

As we have seen in the previous chapter, school shootings are perceived as real threats in the American society, part of which can be blamed upon the phenomenon of moral panic, and can have a major impact on education, as it cannot occur in an unsafe environment. All in all, it is a certainty now that the subject we have addressed in the beginning of this chapter can be a new direction for future research. Americans should take into account not only the classical examples of threats to societal security – cultural cleansing and ethnic cleansing – but also more subtle ones, such as school shootings.

6. BY WAY OF CONCLUSION

We summed all our research to a comprehensive syntagma – “The road to education under gun threat” and studied a multidimensional phenomenon which the United States still has to deal with. During our documentation we noticed that there are lots of aspects concerning school shootings that create various polemics among scholars. So we should not be tempted to jump to superficial conclusions.

But we can stay true to the facts and not hope that school shootings are a problem that will disappear overnight. Maybe the perfect solution does not exist, but the key is in finding answers to a series of important questions that we also brought to discussion throughout paper.

What are the fundamental reasons for school shooting?

Is arming teacher with guns a solution?

Can we talk about moral panic in the present American society?

How does the never-ending problem of school shootings affect the USA's image as a safe society?

Why is not the US capable of managing this problem?

Firearm violence is a preventable public health crisis that causes rage and controversy within a whole nation. America is a diverse country with different points of view on how to make schools a safe place to learn. It remains to be seen whether US will choose to become a shining or burning city on a hill.

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TERRORISM 2.0. THE RISE AND FALL OF THE ISLAMIC STATE

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Abstract: *The idea of an Islamic State appears on the international relations scene as a true black swan. A terrorist organisation emits territorial claims towards international acknowledged states. The speech of its leader, Abu Bakr al-Baghdadi, from 29 June 2014, announces not only the birth of the Caliphate, but also the birth of a new concept: terrorism 2.0.*

How does a not very known terrorist organisation succeeds to establish itself into a political entity, having territory, population, government and legal institutions? The present essay aims to cover the most important reasons that stood behind the rise of the Islamic State. For that purpose, I underline the idea according to which the terrorist organisations are not only terrorist organisations anymore. Their evolution transposes into their claims to territoriality, sovereignty and international acknowledgement.

After its fulminatory military campaigns, the Islamic State fell as quickly as it rose. Their official defeat was announced on 21 November 2017. Still, as we speak, the organisation only possesses a few pockets of desert along the border between Syria and Iraq. Thus, it remains only one important question referring to the organisation’s future.

Will the Islamic state come back to its full strength, will it fade away or will it continue as an ideology, inspiring and funding terrorist attacks worldwide? In order to even trying to draft an answer we need to take into account that the Islamic State set up a precedent. An extremely dangerous one.

Keywords: *terrorism, Islamic State, rise, fall, statehood;*

1. INTRODUCTION

a. WHO? WHAT? WHERE? WHEN?

Islamic State of Iraq and Syria (ISIS) is a militant Islamic sunni fundamentalist group, self-declared caliphate along with Abu Bakr al-Baghdadi’s speech from 29 June 2014, held in the Great Mosque of al-Nuri, Mosul, Iraq. It has the capital on Raqqa, Syria, but it is still internationally unacknowledged. Also, it is the first caliphate since the Ottoman Empire breakdown in 1922.

b. HOW? WHY?

Currently, the United States of America (USA) officially admits 43 active terrorist organisations. Still, none of them has ever made a claim when comes to statehood. So, how did we end up here?

An as simple, as complicated answer could be the very understanding and exploitation of the geopolitical context as it is the Middle East region nowadays. The rise of IS is the result of such an exploitation of the way too many conflicts in the Middle East area.

Of course, being an al-Qaeda “franchise” at the beginning represented a crucial advantage. Back then, the IS was called al-Qaeda in Iraq (AQI) and took advantage of al-Qaeda’s grading structure, modus operandi, human and financial resources.

But, what eventually lead to the IS build up was the catastrophic situation of Iraq after the USA invasion from 2003 and the Syrian civil war. The organisation took leverage of the general incertitude estate generated by the conflicts and gained a lot of support from population. The extremists unleashed from Iraqi prisons, former officers of Saddam Hussein’s army and secret services, the foreign fighters and the sunni population represented the core human resources of IS’s army.

Besides, there were also external factors favourable to IS rise. Although they fought against Bashar al-Assad regime, he was the one who “allowed” IS expansion on Syrian territory for at least 2 reasons: to divide the enemies fighting inside Syria and to decrease USA’s forces concentration against his regime.

There were also identified three USA mistakes which led to IS growth: the Iraq invasion, de-baasification policy and the disband of Saddam Hussein’s army.

c. SO WHAT?

For the first time in Middle East history, a non-statal organisation has made claims to the territorial distribution of internationally acknowledged states. The statu-quo began to be under the gun. IS becomes from an al-Qaeda’s satellite an regional actor, having territorial claims. The biggest threat to the western world and not only.

But, what makes IS different from other terrorist organisations? It may be the amalgamation of the terrorist organisation characteristic with the one of statehood. A genuine black swan. Never had someone done something like this. IS declared itself the restorer of a lost Islamic Empire. And old enemy becomes a new one, extending an also over-extended conflict.

2. FIRST STEPS

IS owes its primary existence to Abu Musab al-Zarqawi, a Hashemite who founded Jamaat al-Tawhid wal-Jihad in 1999. It was initially a training camp near Herat, Afghanistan, destined to Palestinians and Hashemite recruits, sponsored by al-Qaeda.

THE NAMES OF THE ISLAMIC STATE

GROUP NAME	YEARS IN USE
Jamaat al-Tawhid wal-Jihad	1999–2004
al-Qaeda in Iraq	2004–2006
Islamic State of Iraq	2006–2013
Islamic State of Iraq and al-Sham	2013–2014
The Islamic State	2014–PRESENT

Source: The War Between Isis and Al Qaeda for Supremacy of the Global Jihadist Movement, The Washington Institute for Near East Policy, June 2014

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FIG. 1. The names of the Islamic State;

In 2004, Zarqawi presented his faith vow to Osama bin-Laden and Jamaat al-Tawhid wal-Jihad became Al-Qaeda in Iraq (AQI). Although it was considered to be an army full of foreign jihadists, the organisation was very successful within the sunni population due to their lack of an alternative. Practically, the population had to choose between IS bloody activities or the shia’s ones. What would you choose?

After Zarqawi's death in 2006, the Mujahedeen Consultative Council named Abu Ayyub al-Masri as the next leader of AQI. He declared that AQI was part of a mosaic of resistance movements which himself named Islamic State of Iraq (ISI), led by Abu Omar al-Baghdadi. The cross-border partnership between these two was never made official in order to keep by their side the sunni fighters who only wanted to free the Iraq and not to create an Islamic State.

In April 2010, after the death of al-Masri and Abu Omar al-Baghdadi, the next leader of ISI is Abu Bakr al-Baghdadi. He begins the reconstruction of the organisation, which, in 2013, reaches the "performance" to commit tens of attacks daily. Still, ISI was never very efficient due to the American troops incursions and the Sahwa councils, Arabic tribes who defied its brutality.

In 2013, ISI announces its association with the al-Nusra Front, a sunni jihadist militia active in Syria, fighting against Bashar al-Assad regime and initially affiliated to al-Qaeda. It is the beginning of the Islamic State of Iraq and Syria (ISIS). Although the leaders of al-Qaeda and al-Nusra rejected the movement, a crucial part of the fighters loyal to al-Baghdadi contributed to ISIS advance in Syria. In February 2014, al-Qaeda decided to break down any tie to ISIS due to its way to many conflicts with al-Nusra and, also, its bloody activities.

Gaining advantage from political tensions between the shia government and the sunni majority in Syria, ISIS concentrates its forces towards Iraq starting with December 2013. Having the support of many tribes and former Saddam Hussein's regime adherents, ISIS conquer many important cities in Iraq, such as Fallujah (January 2014), Mosul and Tikrit (9-11 June 2014) or al-Qa'im and other 3 cities (21 June 2014).

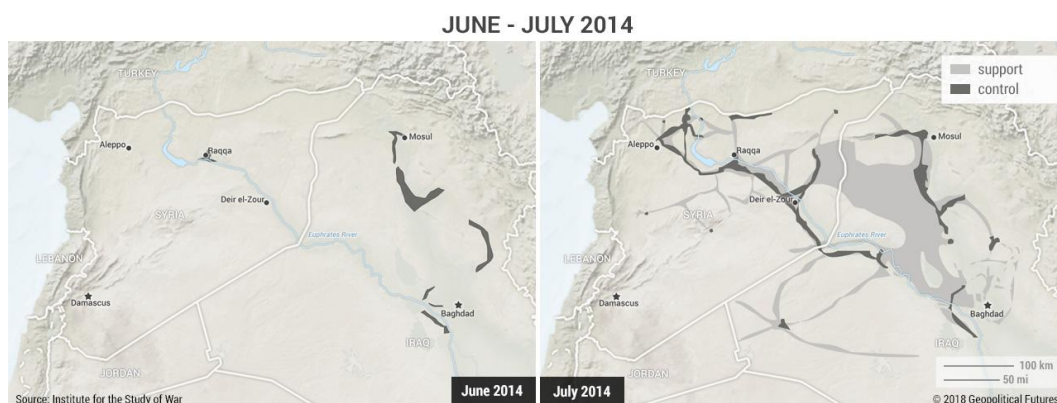


FIG. 2. The evolution IS's territory before declaring the Caliphate and early after;

3. THE RISE

a. THE BIRTH OF THE CALIPHATE

On 29 June 2014, after taking control of some important Iraqi cities, ISIS announces the birth of the Islamic state, the Caliphate. Al-Baghdadi declared himself leader over 1.5 million of muslims and erase the borders. The group will now be known as the Islamic State (IS).

The public image of IS back in 2014 may seem inappropriate. It was presented as a surprise. A big one. A new, brutal, bloody and merciless organisation. But how this image could stand being all things considered?

The IS was not born overnight. The organisation grew gradually, exploiting the conflicts and, also and very important, the wounds of sunni population. Since the beginning, IS has aimed to involve the sunni into their holy war.

Firstly, the group promoted a sectarian-existentialist philosophy in Syria and Iraq. The shia community, bestirred by IS aggressive actions, replied in the same manner towards sunni community. The endgame? Throwing the sunnis into IS's "protective arms". So said, so done.

IS targeted a specific part of sunni community, much more likely to be radicalized. The prisons all around the Middle East, so-called "terrorism academies", served as supply company of human resources for IS. They even attacked the prisons in Iraq in order to unleash the prisoners, most of them joining the organisation after. In Syria, the extremists pardoned by Bashar al-Assad for political purposes, also joined the terrorist group.

The propaganda machine is not to be forgotten. They allured thousands of foreign fighters. To be precise, the phenomenon measured over 30.000 foreigners from all around the world: Western Europe, northern Africa, Balkans, former USSR states and Northern America.

The IS also tried to reach a mystic aura over its head in order to attract more adepts. They promoted a precise type of speech, talking about a future major confrontation between civilizations. The prophecy warns us about "Malahim", the correspondent of orthodox' "Armageddon", after which the muslims will obtain the total and final victory, gaining the control over the entire world. This kind of story was very popular amongst IS fighters.

External factors also contributed essentially to the IS rise. We can include here the Syrian dictator Bashar al-Assad who, indirectly, allowed IS to grow within his state's borders. He thought that if IS succeeded to grow big enough, his enemies fighting the Syrian regime will end up fighting with other terrorist organisations, and his seat will become more safe. Also, considering USA's international war on terror, he thought IS will become one of USA's most important targets and so the concentration of their forces against his regime will be severely decreased.

In Iraq, there are three big mistakes made by USA which helped IS: the invasion of Iraq, de-baasification policy and the dissolution of Saddam's army. A destabilized region is more likely to support groups as IS. For example, between 65.000 and 95.000 destabilized soldiers have joined the IS efforts to bear down the USA.

b. TERRITORIAL TRIUMPH

Considering the political situation existent in Iraq, IS has concentrated its efforts towards it since December 2013. Not after long time, first results appear. In January 2014, the terrorist group succeeded to conquer Fallujah, the first big win from a fulminatory series during the 2014.

June 2014 is a very important month for IS. It successfully took control over Mosul and Tikrit, in 9-11 June, and al-Qa'im and other 3 cities in western Iraq on 21 June, also opening the border with Syria. At the end of the month, on 29th, the Caliphate is being declared.

Shortly after, during July 2014, the group took control over the most important oil field in Homs region, Syria. At the same time, it conquered approximate 100 miles, from Deir ez-Zor to the Iraqi border.

Also in 2014, the first images with IS violence started to spread. The decapitations of American journalists James Foley on August 19, 2014 and Steven Sotloff on September 2, 2014 reach the media attention. IS begins to post carnages accomplished by its militants.

2015 year came with the crackdown of IS expansion. On the contrary, the first losses appear. Even though, IS seemed to be able to manage the situation.

In March 2015, the group recaptures the biggest part of Tikrit and on April 1st took control over the whole city. IS made its' last conquests in May, by gaining control over Ramadi and Palmyra cities.

c. ISLAMIC STATE vs. AL-QAEDA

To reach a better level of understanding of IS and the politics behind its rise, a comparison with al-Qaeda could do nothing but help. Both organisations appeared as a result of civil wars. The al-Qaeda firstly appeared during the USSR invasion in Afghanistan (1980-1989), and the IS took leverage of USA invasion in Iraq and its conflict with Syrian dictator.

In spite of the fact that both organisations promoted violence against the far enemy, USA and western countries, IS crosses this line and put a target on the head of non-sunni muslim community or sunni but not extreme enough muslim population.

In comparison with al-Qaida, ISIS succeeded to self-ensure the financial resources they needed. According to Luay al-Khateeb, energy expert: "At IS's climax, the oil sold by organisation on the black market used to bring almost 3 million dollars a day."

Besides this, IS exceeded al-Qaeda in terms of publicity too. IS has adopted and improved Zarqawi's bloody tactics. The organisation even created its own video and social media canals to disseminate the videos. These canals were also the most important way to keep contact with people around the world and convince them to join, becoming part of the foreign fighters phenomenon.

IS also overstepped al-Qaeda in terms of military force. They proved their high capacity to strike the targets they wish. Starting with 2014, in just one year, IS conquers a territory equal to Great Britain, much more than al-Qaeda was ever capable of.

Practically, in contrast with al-Qaeda, IS represented: a terrorist organisation; a conventional army; a very efficient criminal organisation by controlling the grey cross-border markets of oil and arms trafficking; an advanced intelligence service and one of the best propaganda machines in the history.

d. THE STATE

Thus, IS proved itself much more brutal and very efficient at conquering territories. The hard is yet to come: administration of conquered territories. How a terrorist organisation will succeed in convincing the population about its legitimacy?

Maybe they won't even try. At the beginning, IS chose to control the new "acquisitions" through fear. Then came the indoctrination part. The organisations posed in a true military force in terms of territorial administration. This is the main reason they were so hard to be confronted.

Their statehood aspirations require a certain type of behaving. You cannot act as a barbarian but expect to be elected on the European Parliament. By acting like this, how are they different to the Syrian regime, the one they fight against?

Moreover, the most important part of IS is its military force. A military force which is assured by the combative capacity of their fighters. But IS never had a professional, national army. An important part of their fighters joined due to financial or religious reasons or curiosity.

IS needed a well-defined grading structure to maintain the legitimacy of the new-born "state". This is why they created governmental structures for territories shortly after the battle had ended. IS has managed to set-up cabinets, governors, financial and legislative institutions. They even created schools, road senses and even policies of thrash storage.

The territory is divided in lands, so-called “wilayat”. Every wilayat has its own governor. IS erases the boundaries within the Middle East. Many wilayats contain territories both from Iraq and Syria as we know them.

Their leader, Abu Bakr al-Baghdadi, has its own cabinet, the Shura Council. It is composed by twelve ministers on distinctive domains. Among them, they are in charge with: public health (full operability of hospitals; newborns are registered and receive a SI identity card), education (activity of schools and universities; in Mosul, boys and girls are educated separately; they are forbidden to learn art, music, physical education or philosophy), religious education, transportation, environment protection politics, justice (maintaining the Islamic law, the Sharia, respected).

ANATOMY OF ISIS

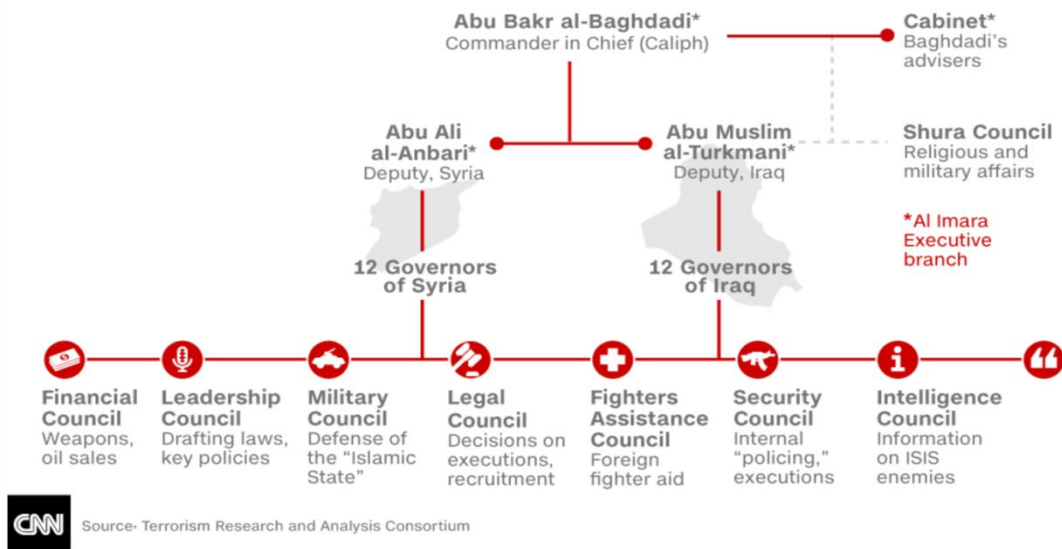


FIG. 3. The anatomy of Islamic State;

Paradoxical, the grading structure of the Islamic State begins to look very much alike with the one of western countries’, whose values they fight against so hardly.

4. THE FALL

In 2014, at its climax, the organisation controlled over 90.000 km². Starting with 2015, first losses appear. Slow and sure. At the end of 2015, IS has already lost approximate 14% of the territory conquered lately. Also, the income was proportionally decreasing with the territory.

2016 is catastrophic. Organisation’s income went down to 50 million dollars a month. Consider that in 2014-2015, the number was over 80 million dollars. Besides, territorial losses from northern Syria in favour of the kurdisch militias, cities Ramadi, Tikrit and Baiji refineries are profoundly indigestible. Until the end of the year, IS has already lost 35% of its territory.

In 2017, IS controlled only approximate 35.000 km². The international coalition led by USA, Iraqi army and Syrian Democratic Forces (SDF) cause huge losses to IS. Cities of Mosul, Raqqa, Palmyra were taken back. The finances broke down to almost 16 million dollars a month.

At the time we speak, IS is virtually landless. It still controls some pockets in the desert of eastern Syria and western Iraq and a foothold near Damascus.

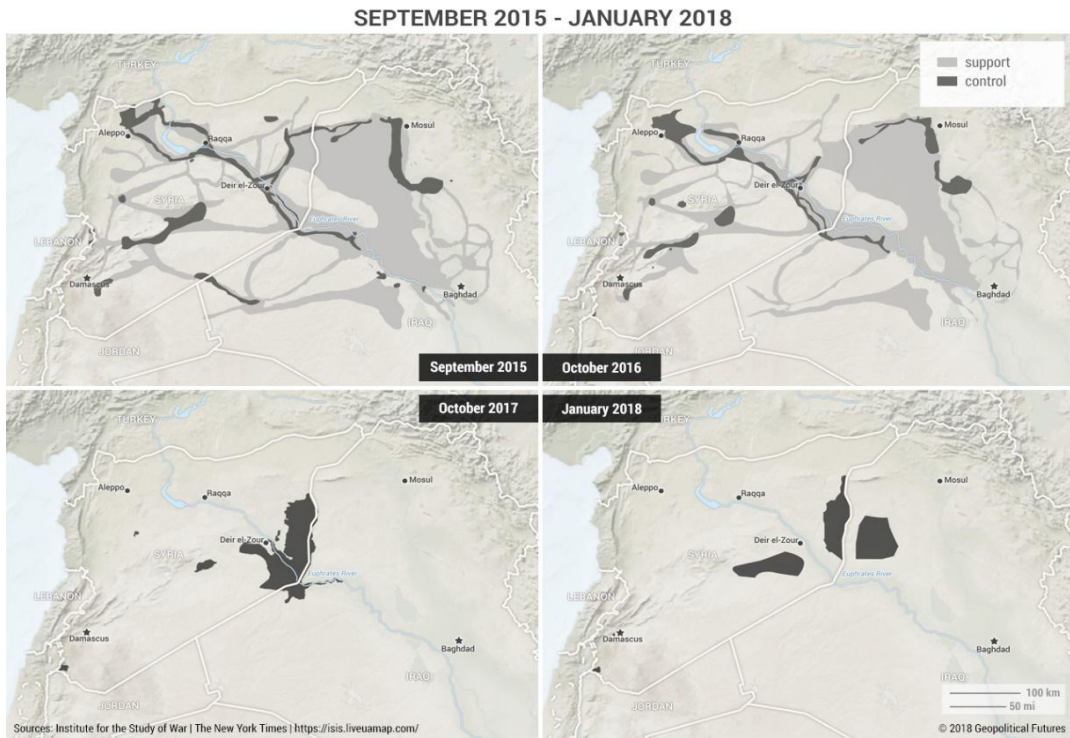


FIG. 4. The evolution of Islamic State's territory;

Still, the organisation have various adept secretly operating in Syria, Iraq, Egypt, Libya, Afghanistan or Philippines. So, the IS continues to represent an international threat.

Thus, a fulminatory ascent followed by an endless decrease. How did it end up here? Nothing that happened in 2014 anticipated such a continuation. It is hard to find an answer, especially now. The complexity of different variations hardens the pursuit. It may be the weak strategy, the deficient management or the lack of experience. I guess we will find out.

The IS biggest mistake was, for sure, their endless fight with everyone. The organisation has never sake for allies. Moreover, the negative publicity gained as a result of their bloody activities only amplified the international defiance towards it.

4. CONCLUSIONS

Emma Sky, british adviser around USA army in Iraq, declared that: "Corrupt regimes and terrorists keep up one another. It is a symbiotic relation."

The destabilized Iraq after the USA invasion from 2003 and the lack of a coherent reconstruction program proved himself the best environment for the rise of extremist movements. Also, the Arab Spring had serious consequences to the Syrian regime. Bashar al-Assad faced mass protests, being forced to take some political decisions which amplified the extremist views in region. The dictator fought against the rebels, some terrorist entities, and later, due to its human rights contraventions, the USA. They all had one wish, get the dictator down.

So, IS only had to take advantage of the geopolitical favourable context. The sunni population is in minority in Iraq and in majority in Syria, but under a shia government. The perfect target for an organisation as IS. Propaganda and indoctrination campaigns reached their targets. Moreover, here comes the foreign fighters phenomenon. IS posed as a last defence line against the infidel USA, apostate arab nations from Gulf and alawit dictatorship in Syria and the one from Iran. There is ideology.

There are objectives, very adventurous ones. There comes the army too. What is next? The re-establishment of the Caliphate.

Even though IS is not the first terrorist organisation, they revolutionized the terrorism concept. I can say they even created a new one: terrorism 2.0. An already important asymmetric threat, the terrorism gains new valences. A new-born Islamic State, even if unacknowledged. It is the first time when such an organisation made territorial claims to some internationally acknowledged states. Even if not enough successful, it creates a precedent. A very dangerous one.

To conclude, the organisation represents the most successful militant group of all times. In spite of losing their territories, IS continues to inspire, sponsor or even commit terrorism activities internationally. The biggest question to be posed is about IS's future. The small territories they still control as we speak are not meant to last forever. Thus, what comes after the Islamic State?

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THE SEPARATIST MOVEMENT IN CATALONIA, SPAIN

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Abstract: *The objective of this study is to emphasize the separatist movement as a phenomenon of influence on the masses. This study presents a polyhedral analysis including a short history of the separatism (both as a general phenomenon and as a customized one), causes and explanations, effects and influences, and, of course, predictions about its future based on the observed tendencies . For a better understanding of separatism in Europe, it describes the situation in Spain, more precisely in the region of Catalonia, as a case study, to picture it both socially and politically.*

The choice of this theme came as a response to the requirement of analyzing a current social phenomenon, which will intensify in the propagandistic context of asymmetric threats and anti-globalization tendencies. The current security environment is crossed by significant changes. As far as society is concerned, the separatist phenomenon affects its two essential entities: culture (national identity) and policy (territorial integrity). Thus, there are risks of societal and political insecurity.

This topic is suitable for the social sciences, primarily due to the typology of the causes leading to the propagation of the phenomenon. The scourge of the separatist tendencies is fueled by an increasing need to stand out of groups defining their national identity as enclaves in the 'super-culture' of another nation. Hence, it is amplified by the addition of the economic, political and social causes and effects, like a slippery slope, becoming a mass phenomenon.

Keywords: *separatism, cultural shock, social memory, ethnocentrism, deculturation, discrimination, secession, oppression.*

1. INTRODUCTION

By separatism or secession we comprehend the intention of some inhabitants of a territory to separate themselves from a larger ethnic, social and religious group, or from the state to which they belong; at the same time, it can also be defined as a movement, a current that supports political separation, autonomy towards a unitary state [4].

A classification of this phenomenon captures three types of separatism:

- Territorial separatism, which is a form of segregation that is widespread nowadays. As we may learn from historic sources, the borders of states have often been revised. In the past, boundaries were delimited in the limit of the state's ability to protect them from the invasion of foreigners [2]. In the view of some specialists in this domain of international law, in the process of claiming the right to secession, secessionists must prove that: 1) they are "a people"; 2) the state they currently belong to violates their rights brutally; 3) there are no alternative solutions to solve the conflict, neither in the domestic law nor in the international one [5].

- Political separatism - a political movement that seeks to separate a region, a province or a state, from the country or a wider ensemble to which it belongs, acting especially by peaceful or violent means; sometimes it is possible to use the mentioned methods concurrently.

Carrying into effect this desire or expectation means more than just obtaining it, one way or another, that is the total rupture of the state to which it belongs and the recognition of the new statal entity by the international community as a sovereign, independent and autonomous state [5].

- Ethnic Separation – At present, ethnic disputes are the major threat to peace and security . The ethnicities are confronted, first and foremost, with the national states and, from this point of view, these types of conflicts are asymmetric. It seems, however, that the advantages do not belong to the national states, but to the ethnic groups, on the one hand, because such a trend somehow supports the process of globalization; on the other hand, because the problem of the ethnic separatism is not acutely put in the area of the great powers and in the super-technologized states with very high living standards, but in the poor countries [5]. The expression "ethnic cleansing" has often served as a mean of nourishing ethnic separatism. In the view of ethnic separatists, the framework of ethnic purifying is the national state in its attempt to homogenize its population around a model of language and culture, while violating the rights of the representatives of other ethnicities, which are also part of that state [7].

2. CASE STUDY: THE SEPARATIST MOVEMENT IN SPAIN

Catalonia, Spanish Cataluña, Catalan Catalunya, is a comunidad autónoma (autonomous community) and historic region of Spain, located in the northeastern extremity of the Iberian Peninsula. Its population is about 7.5 million people, it has its own government, its own language, Catalan, the second largest city in the country, Barcelona, and its own economy [9]. It is one of the richest and most traditional Spanish regions, with a distinct culture and an acute sense of its national identity, defined independently from the Spanish one.

The separatist tendencies in this region have deep roots in history, but they reach the peak in October 2017, when the Catalans expressed their request for independence through a referendum. The hostile response of the Spanish government determined the reaction of the Western press and the popularization of the phenomenon on a large scale.

3. SHORT HISTORY

A historical perspective on the phenomenon itself brings to the fore three fundamental stages in its evolution.

The first refers to the period of colonial empires, when entire communities were "absorbed" by the invaders and aligned to a completely new culture. This form of separatism is named 'decolonization', as a return to the original identity pattern; of course, it had often been used as a pretext to justify the communities' aspirations to be recognized, as they were united by a mutual enemy and the instinct of survival. I find relevant to this the explosion of nations after the British and Portuguese decolonization.

It was followed by a more pretentious concept, a form of separatism legally regulated in the international law, the right to self-determination of peoples. It continues the idea of the colonies' right to independence, claiming the right of national groups to choose their own political system, to pursue their own economic, social and cultural development within an existing state [5]. Springtime of the Peoples and President Woodrow Wilson's Fourteen Points are historic moments of using the principle of self-determination for the international recognition of some states, including Romania.

The third stage is the separatism itself or the secession. Here, the foundations which justify the tendency are related to cultural identity, economic aspects, extremist propaganda, circumscribed to the asymmetric framework of current threats' evolution.

It is said that the tone of the secession movements was given by the proclamation of the Independent Republic of Kosovo. Its recognition as a state by the EU only accelerated the germs of the phenomenon. Of course, similar situations are still in Scotland (2014 Independence Referendum) and the Republic of Moldova (the two separatist vulnerabilities in Transnistria and Gagauzia). They are continuing to expand in Europe.

As respects Catalonia, it is noteworthy that it has its own history, dissimilar to the Spanish one, because it was an independent region in the Iberian Peninsula for a long time. It appeared in 1150, with the marriage of Petronilla, Queen of Aragon, with Ramon Berenguer IV, Count of Barcelona. They created a dynasty to inherit the territories of Catalonia and Aragon. It lasted until the reign of King Philip V. The Spanish War of Succession ended with the defeat of Valencia in 1707, of Catalonia in 1714 and finally of the last island in 1715, which led to the birth of modern Spain [9].

The next emperors tried to impose the Spanish language and laws in the region but renounced in 1931 and restored the Generalitat (the National Catalan Government). General Francisco Franco, however, tried to destroy the Catalan separatism claim, and with his victory at the Battle of Ebro in 1938 he took control of the region, killing 3500 people and sending more in exile [9].

The region regained its autonomy in 1977, when it returned to democracy. Requests for absolute independence have grown steeply until July 2010, when the Madrid Constitutional Court canceled a part of its autonomous statute in 2006, claiming that there is no legal basis in order to recognize Catalonia as a nation within Spain [9].

The 2008 economic crisis has served as an amplifying factor for Catalan independence, and the rich region of Barcelona is seen as supporting the less developed areas of Spain. In November 2014, the Catalan government organized an informal referendum on independence. The results showed an 80% majority in favor of declaring it. On September 6, 2017, a new law of the Catalan government to hold a referendum came into force, but it was rejected by the Spanish government two days later [1]. Thus, on October 1, the referendum was held to justify the Catalan secession tendencies. According to the organizers, 2.2 million citizens voted in this referendum and over 90% of those who voted, did it for independence, but the attendance rate was only 43% [8]. More than a popular consultation, the referendum was a highly publicized event. The Spanish authorities considered it as an attack to Spain's sovereignty and integrity and acted accordingly. Referring to the controversial Article 155 of the Constitution, the government declared the referendum illegal and determined the police to stop the polling process: they shoved the voters, broke the windows of some polling stations, shot with rubber bullets, used cartridges with tear gas. Special police troops broke into the station where the head of the Catalan government, Carles Puigdemont, was going to vote.

4. CAUSES AND EXPLANATIONS OF THE PHENOMENON

The range of causes which contributed to the expansion of the phenomenon can be structured on two levels: economy and society. Of course, there are more reasons, for example political ones, but they are subsumed at one point to the types already mentioned.

The economic motivation is rooted in the perception of Catalonia as the engine of the Spanish economy, as it is one of the richest regions in the country. Implicitly, it supports less productive regions.

At the same time, the region pays taxes proportionally to its economic capacity. In the Spanish economy as a whole, Catalonia is a strategic region, accounting almost 20% of the country's GDP [9]. Hence, the need of fiscal independence strengthens the illusion of a more prosperous state, by detaching from Spain and the taxes imposed by Madrid.

The social causes are centered on the appeal to the social memory of the repression of the Francoist dictatorship. Against this, cultural elements converge, such as:

- The cultural shock is the feeling of surprise and disorientation that occurs when people come into contact with cultural practices totally different from theirs [3]. As far as Catalonia is concerned, the cultural shock emerged with the takeover of power by Francisco Franco, the initiator of the suppression of Catalonia's national culture.

- The deculturation is a process of involution suffered by an ethnic entity's culture [3]. As a result of the Francoist repression, the Catalan culture was damaged; although the population defends their cultural identity vigorously, they actually support an imminent mixture caused by the contact with any oppressive regime. However, the Catalan spirit has kept the tradition and the historic legacy alive, rising a highly promoted and distinct subculture, within the host country, which is Spain.

- The ethnocentrism is the tendency to place your own ethnic group at the top of the symbolic hierarchy of prestige, and the outgroups in the lower positions. It also implies evaluating others according to the standards of your own group [3]. The profound nationalist feeling of the Catalans is based on both economic and cultural statutes of the region, confirming the stereotype that describes them as a stubborn, selfish and proud people, but also as hard-working and ambitious in contrast to Spanish men, who are sensitive, hospitable, but more focused on entertaining themselves). Despite being affected by the dictatorship period, Catalan culture stands out through diversity, bringing together a number of resonant names in the Arts' domain, such as Salvador Dali and Antoni Gaudi. It is a strong, resistant culture which magnifies the Catalan national spirit.

- The discrepancy between masculinity and femininity in the cultural model proposed by Geert Hofstede, between Catalonia and the rest of Spain. While the Catalan culture is masculine by excellence, as people are seen as assertive, successful, ambitious, competitive, strong, willing to direct conflict, with well-defined social roles of sexes, the Spanish is feminine (people are encouraging themselves to modesty, valuing interpersonal relationships and tenderness, negotiating and even compromising, overlapping the social roles of men and women, having good relationships with superiors, and generally choosing the win-win type of situations) [3].

- The linguistic discrimination in the same dictatorial period has put its mark on the evolution of Catalan nationalism. This continues nowadays. Even though Catalan has been declared the official language of the region, major differentiations are made. Perhaps a child speaks Catalan at home, but on the playground it is a small pawn immersed in the dominant culture and speaks Spanish.

Through a competitive analysis, we may find the paradoxical coexistence of causes that determine perceiving Catalans as victims, with fact that they consider themselves a culturally superior minority, which is generated by the error of ethnocentrism. Whatever the perspective, it is certain that the Catalan people is hiding under the umbrella of victim of history. There are political and economic reasons which dictate the movements in the struggle for independence.

5. EFFECTS AND INFLUENCES

An immediate consequence of the Catalan referendum was the implementation of Article 155 of the Constitution to suspend the autonomy of Catalonia. The next move was organising early parliamentary elections in December of the same year [6]. Moreover, Catalan Prime Minister Carles Puigdemont along with several ministers were dismissed and, in order not to be arrested, they asked for political asylum in Brussels. Although the election results proclaim the majority of secessionists in parliament, the administration of the region will be cumbered by the absence of Puigdemont, who can not return to Spain, as long as the accusations of disobedience, rebellion and misappropriation of funds which have been imputed to him, persist.

A significant social effect is the emergence of ‘pro-secession’ campaigns. As far as the Catalan ones are concerned, they are regarded as propaganda and misinformation. The involvement of Russian intelligence services is speculated, as it is inferred that they may support separatist movements, in order to destabilize the European area.

Also, the confirmation of prejudices against Catalans would normally lead to prominent discrimination of this population. However, interviews and opinion polls have shown that the Spanish community is rather being discriminated against by Catalans.

The region’s economy has suffered as a result of the referendum. The credibility of the Catalan firms declined, many investors withdrew, the export rate shrunk dramatically, as most of the exports were to EU member states that support Spain in this crisis.

The influences of the Catalan separatism follow the trajectory of the domino principle, announcing a wave of future referendums in order to proclaim new nations. From these, the separation of Scotland from the UK is notorious, being scheduled to possibly happen in 2019. At the same time, a separatist poll in northern Italy, which includes the regions of Lombardy and Veneto, announced their desire for autonomy and the organization of a purely ‘consultative’ referendum in this regard.

6. FORECASTS

In a favourable scenario of the international recognition of the state of Catalonia, the region would face the difficulties of economic, political and even social transition. In the first instance, the separation from Spain would lead to leaving the EU and the Schengen area as well as attracting external debt. The Catalan economy would be deeply affected and would lead to a significant lowering of living standards, the loss of many jobs and a decrease of salaries and pensions. A wave of social insecurity would cross Catalonia and sink it into an indefinite financial crisis.

At a macro level, the separatist project in Europe announces a future crisis of statehood, when solid communities would begin to request a state of their own, built on their identity. The result? A divided and vulnerable Europe, turned into a fertile ground to materialize threats. There would also increase the risks of xenophobia and the popularity of some types of societies dominated by inequality, incompatible with the pattern of Western democracies.

At the end of this paper, I will reiterate the major social impact of the separatist phenomenon, having as reference the referendum in Catalonia. Whether we talk about identity crises, feelings of persecution, appeal to social memory or discrimination, the levers of secession entail political and economic games. Inherently, the cultural identity of the masses becomes the pretext of destabilizing actions, directly affecting the security of the state.

The 21st Century may become the ‘nation-boom’ century, the witness of great geopolitical mutations. The retrospective on the separatist outbreak would be essentially and exponentially fueled by the referendum in Catalonia.

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IMPLEMENTATION OF MAN-IN-THE-MIDDLE ATTACK AND DEFENSE MECHANISMS

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Abstract: *In today's world, the rapid convergence of information and communications technology has allowed for a common base of standards, interfaces and security policies. Nowadays, it is much more easier to connect to the Internet through wireless networks and the expected availability of such networks in restaurants, hotels and other public places makes for a great attack vector as they expose their users to many security risks.*

This paper describes a MITM attack based on ARP poisoning, DNS Spoofing and SSL Stripping with appropriate defense mechanisms are suggested.

Keywords: man-in-the-middle, security, risk, ARP, DNS, SSL

1. INTRODUCTION

The basic concept behind this type of attack is to intercept a communication between two parties, capture the data and modify the content or inject false information in the given communication. Some of the most common types of attack are Address Resolution Protocol (ARP) cache poisoning, DNS spoofing, session hijacking, and SSL stripping.

The aim of this paper is to raise awareness of such possible attacks in computer networks. In order to implement a defense strategy against this type of action, we had to implement a MITM attack using penetration testing tools and techniques all preformed on a local software simulated laboratory.

2. MAN IN THE MIDDLE

A man-in-the-middle (MITM) attack requires the attacker to interpose himself between two (or more) legitimate endpoints in a network. Then, he takes advantage of the weaknesses in the authentication protocols and manages to impersonate as the communicating party for each of the two endpoints. In this moment, the intruder can secretly listen to any conversation between the parties, or to modify the communication with a bad intent. Figure 1 shows a typical MITM scenario.

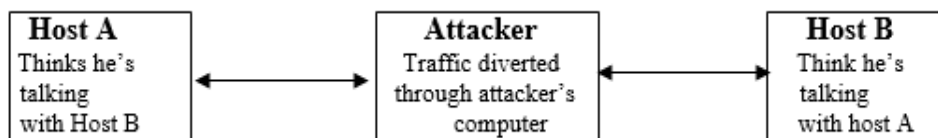


FIG. 1. Attack scenario

MITM attacks can be active - the data is intercepted and modified before reaching its destination - or passive, where the captured data is recorded, stored and sent to the recipient without tampering with it.

In this experiment, several attack techniques are used:

- ARP Cache Poisoning
- DNS Spoofing
- Session Hijacking
- SSL Hijacking

2.1 ARP Cache Poisoning

ARP (Address Resolution Protocol) poisoning is a technique used to corrupt the ARP table of a host in such way that it will allow the hacker to redirect traffic to his machine, making it look like the network switch ^[1]. This attack can only be performed in the same local network as the victim.

An ARP request is broadcast to all machines on the LAN to find the owner of a known IP. This request is examined by each device and the corresponding machine will return an ARP reply with its MAC address. A cache of ARP entries is kept to minimize the number of packets being transmitted and it is updated when a new IP/MAC association occurs.

A successful ARP poisoning attack will associate the attacker's MAC address with the IP address of another machine in the same network (eg: a hub or a switch), causing all traffic on that network to be routed through the attacker's computer before reaching the original destination.

2.2 DNS Spoofing

Every time we access a website, the *Domain Name Server(DNS)* resolves the Internet domain names (eg: *www.google.ro*) to IP addresses (eg. *172.217.22.35*). Using DNS Spoofing techniques, the attacker's DNS server will answer lookup requests from users, redirecting traffic to a certain website or IP where malicious programs or scripts can be hosted^[2].

In this way, *www.google.ro*, which normally would have translated to *172.217.22.35*, is being redirected to *10.17.10.5* (eg: a malicious website controlled by the attacker). Figure 2 and Figure 3 illustrate the normal, respectively the modified operation of DNS server.

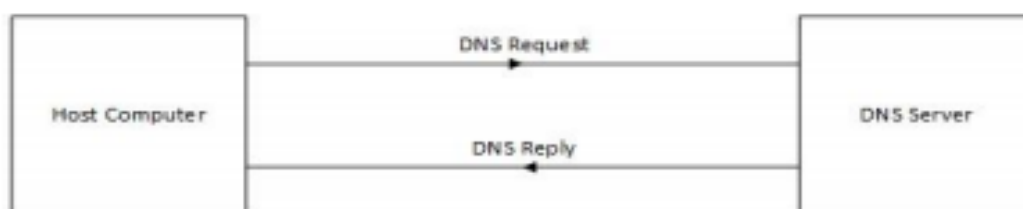


FIG. 2. Host – Server communication

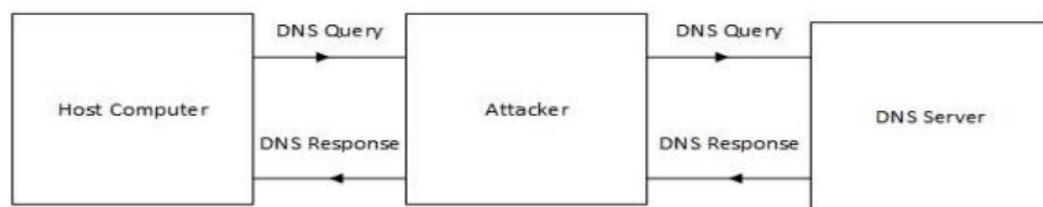


FIG. 3. Spoofed DNS operation

2.3 Session Hijacking

A computer session is a temporary connection between a client and a server. *Session hijacking* (also known as *cookie hijacking*) is a type of web attack used to gain unauthorized access to the server by taking over a user's genuine authentication token

called *session ID*^{[3],[4]}. This token is usually stored within a *cookie* or URL and it can be acquired by inspecting certain HTTP requests with tools such as Wireshark or by using cross site scripting. This type of attack applies only to the machines in the same Local Area Network and the intrusion's detectability is subjected to the user's technical knowledge.

2.4 SSL Stripping

HTTPS (Hyper Text Transfer Protocol/Secure) is the most commonly used protocol capable of ensuring a secure connection between a server and a web browser. Usually, the browser sends a HTTP Request, and, if the website is accessible through HTTPS, the server will send back a HTTPS Reply^[5]. The attacker, using SSL stripping techniques, removes the secure aspect of the transmission keeping a map of the changes and, if needed, is capable of adding it back before sending the request to the server.

3. TOOLS AND TECHNIQUES

This section offers a brief description of the tools used to conduct our experiment, as well as the methodology for different types of attacks.

Penetration testing consists of four stages:

- planning
- discovery
- exploitation
- reporting

In the *planning phase*, a set of objectives, scopes and rules are clearly defined in order to satisfy the customer's needs and before starting the actual testing, the parties must reach a legal agreement.

The actual testing starts from the *discovery phase* where scanning and enumerating procedures are used collect information about the target, the network and all the subsystems.

During the *exploitation phase*, various automated tools are used to take advantage of the discovered vulnerabilities and gain acces into the systems. Fine tuning and continuous interactions are permanently performed throughout the whole process.

In the last phase, *reporting phase*, a detailed report of the vulnerabilities found during the penetration testing is offered, along preventive defense strategies and security patches^[6].

Next, we will give an overview of the tools, their usage, brief description and how they exploit the system vulnerabilities. For this scenario we used the following tools:

- Ettercap
- Driftnet
- Nmap
- SSLstrip
- DNS2Proxy
- Wireshark

Ettercap analyses many network and host protocols and it can operate in one of the three modes : IP based, MAC-based or ARP-based. In this experiment, it is used to ARP spoof certain target machines. *Driftnet* can listen to the network traffic and display the images and URLs seen by the victim.

Nmap is a security scanner which can "map" the computer network with all discovered hosts and services on that network. *Wireshark* is a packet analyzer used to capture traffic on a particular network interface and view in plain text the HTTP traffic from our victim.

DNS2Proxy is a tool used for post-exploitation once the victim's DNS server has been compromised, while *SSLstrip* is used by the attacker to intercept HTTPS redirects and turn them into HTTP replies.

4. IMPLEMENTATION

The attack is based on traffic sniffing using Ettercap, DNS Spoofing and SSL stripping. The attacker uses a Kali Linux^[7] (64 bit) virtual machine, while the victim uses a Windows 7 Ultimate (64 bit) system. Both system have 2 GB of RAM, 3 CPUs, a Gigabit Network Interface Controller operating in Bridged Mode allowing them to be connected to the same network.

For this particular scenario, the victim will try to access two webpages (*www.mta.ro* and *www.twitter.com*) which will help to illustrate the DNS Spoofing and SSL Stripping methodologies.

The steps for the attack phase were the following:

1. Install operating system on the attacker's PC.
2. Scan network with Nmap and select target(s) IP and gateway IP.
3. Enable packet forwarding.

```
$ echo 1 > /proc/sys/net/ipv4/ip_forward
```

4. Create malicious website index file and start local web server on Kali device.

```
$ cat /var/www/index.html
```

```
$ service apache2 start
```

5. Modify the file *etter.conf* to use *iptables* and *etter.dns* to redirect certain requests to the website previously created. In our case, the request to access *www.mta.ro* will be routed to our server at *192.168.1.101*.

6. Open Ettercap and start *Uniffied sniffing* on the appropriate network interface (eg: *eth0*). Figure 4 shows Ettercap's interface.

7. Scan for hosts and select the targets.

8. Select ARP Poisoning to start the MITM attack.

9. Load *dns_spoof* module from the *Plugins* menu to enable DNS spoofing.

10. To meet all the required conditions for *ssl stripping*, a new routing rule must be added to the *iptables*, redirecting all TCP traffic from port 80 to port 9000.

```
$ iptables -t nat -A PREROUTING -p tcp --destination-port 80 -j REDIRECT --to-port 9000
```

11. Start DNS2Proxy and SSLstrip.

```
$ python dns2proxy.py
```

```
$ sslstrip -l 9000 -a
```

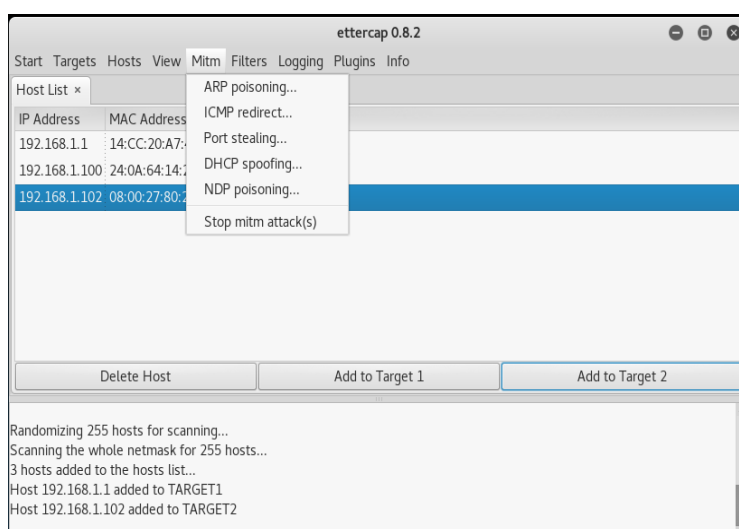


FIG. 4 Ettercap's interface

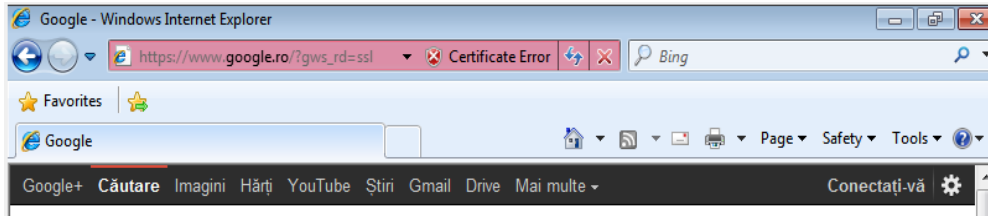


FIG. 5 Successful ARP Poisoning

Figure 5 confirms that the ARP attack was successful. Although the user is prompted with a certificate error, he is still able to access the Internet. Next, we conducted a *DNS spoof* as seen in figure 6.

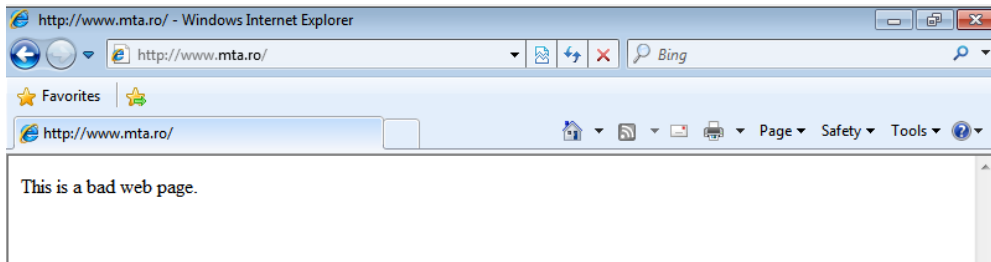


FIG. 6. Spofed website

Figure 7 depicts the victim who is trying to log into his personal account on *www.twitter.com*. As it can be seen, the HTTPS traffic has been redirected to HTTP. Figure 8 shows that the attacker has successfully acquired the victim's credentials. This information can be found in the *sslstrip.log* file.

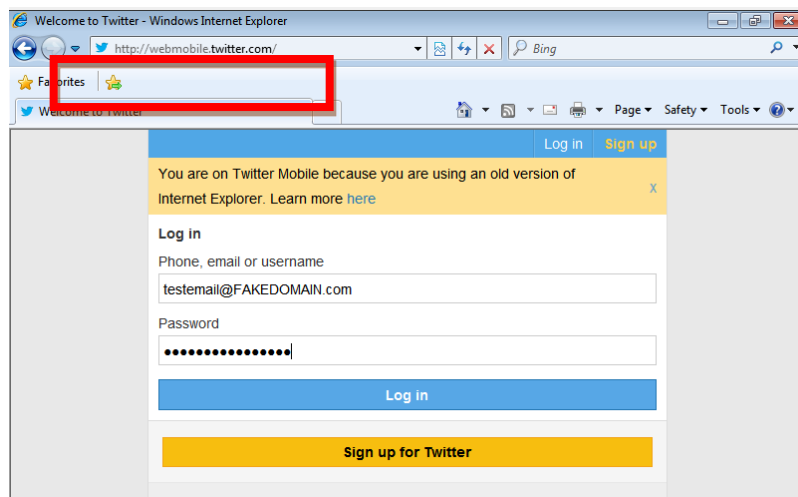


FIG. 7. Successful SSL Stripping

```

f37e7a87825aa0ad7b55c3268fb73594cb1cc677;
_twitter_sess=BAh7CSIKZmxhc2hJQzonQWN0aW9uQ29udHJvbGxlcjo6Rmxhc2g6OkZsY
fe32ca2c2f04f6c3f95c344153dfb6600b2078d0; d=32; mobile_metrics_token=151880114843771823; zrca=5;
_mb_tk=c8edeb9d8daa13c5ab1f2c4b7184e733
2018-02-16 12:24:40,829 Sending header: content-type : application/x-www-form-urlencoded
2018-02-16 12:24:40,829 POST Data (mobile.twitter.com):
authenticity_token=c8edeb9d8daa13c5ab1f2c4b7184e733
session%5Busername_or_email%5D=testemail@FAKEDOMAIN.com&
session%5Bpassword%5D=NOTAREALPASSWORD&remember_me=1&wfa=1&commit=+Log+in+&ui_metrics=
018-02-16 12:24:40,979 Got server response: HTTP/1.0 301 Moved Permanently
018-02-16 12:24:40,979 Got server header: connection:Keep-Alive
2018-02-16 12:24:40,979 Got server header: content-length:0
2018-02-16 12:24:40,979 Got server header: date:Fri, 16 Feb 2018 17:24:44 GMT

```

FIG. 8. Acquired credentials

5. COUNTERMEASURES

After concluding our experiment, we propose a series of countermeasures against these types of attacks, as follows:

- To prevent ARP Poisoning, static ARP entries should be used for critical services along with ARP spoofing detection and prevention software,
- To prevent DNS Spoofing we should secure DNS cache and ensure our software is up to date with all the security patches,
- While surfing the web, we should pay attention to the links we click as well as where we use our credentials,
- VPNs should be used in public unsecured networks if we need to use internet banking or we need to transmit sensitive information.

6. CONCLUSION

The methods for conducting a MITM attack are varied and they can be implemented in different manners using different tools. The above mentioned defense strategies are rather simple but efficient. In our experiment, we present the benefits of penetration testing a network and acknowledging the vulnerabilities in order to deploy security patches. We also demonstrate how a person with minimal Networking and Computer Science knowledge can have easy and unrestricted access to a lot of tools capable of disrupting critical services.

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OPTICAL PHENOMENA IN THE ATMOSPHERE

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Abstract: *This paper aims at a systematic approach to some optical phenomena in the atmosphere, seeking to describe and explain them. The play of light among drops of water, dust or ice crystals produce a series of visual performances in the atmosphere, some of which are visible almost every day, while others only occur once in a someone’s lifetime. The present study focuses on some spectacular atmospheric phenomena such as: the sunrise, the sunset, the azure of the Sky, mirages, rainbows, halos, polar auroras and the green flash (or radius).*

Keywords: *optical phenomenon, light, atmosphere, sky*

1. INTRODUCTION

The study of the different physical phenomena and processes which take place in the earth's atmosphere, such as absorption and heat radiation, air heating and cooling, general air movement and circulation, evaporation and condensation of water as well as electrical and magnetic phenomena that occur in the atmosphere have led to the appearance of a new branch of study in physics studying the atmosphere, called the physics of the atmosphere. There are several branches in the physics of the atmosphere which study different aspects: statics, thermodynamics, dynamics, electricity and optics of the atmosphere, meteorology and aeronomy (the last one is the science of high and medium atmosphere). [1]

Atmosphere optics studies the way in which the unique optical properties of the terrestrial atmosphere cause a wide range of spectacular optical phenomena. Atmospheric optical phenomena often occur due to the interaction between visible light, sunlight, moonlight or starlight interacting with the atmosphere, the clouds, water, dust and/or other particles. [2]

Light is a part of the electromagnetic spectrum composed of seven basic colors known as ROYGBIV (red, orange, yellow, green, blue, indigo and violet) and a wide range of intermediate colors. The difference between one color and the other lies in the wavelength or characteristic frequency. Our eyes are a kind of "sensors" that capture these wavelengths and our brains interpret them as colors (Fig.1). [3]

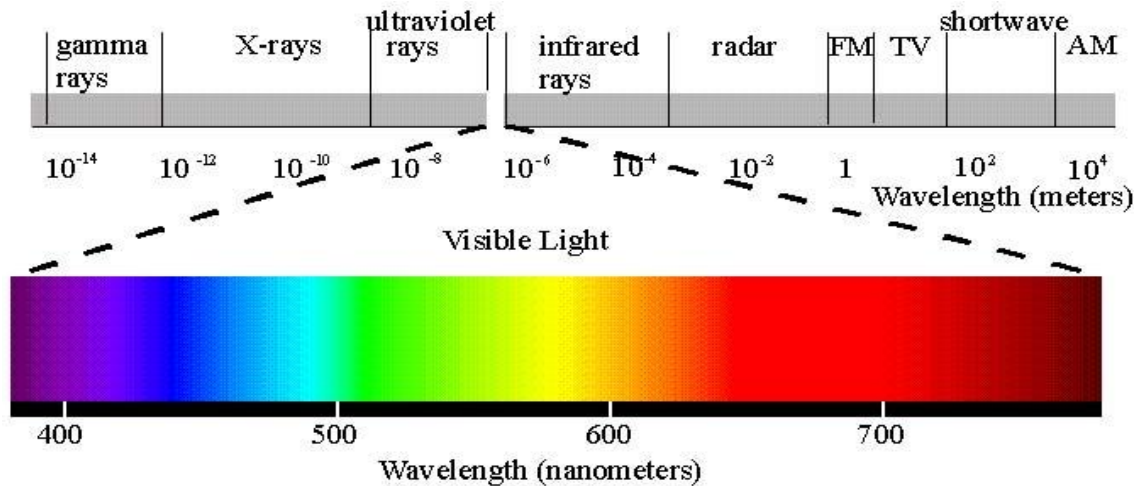


FIG.1. The electromagnetic spectrum of visible light

2. OPTICAL PHENOMENA IN THE ATMOSPHERE

2.1. The Sunrise and the Sunset

The sunset is the daily disappearance of the Sun under the horizon as a result of the Earth's rotation. The sun will be positioned exactly to the west, to the equator, to the spring and autumn equinox, which both take place only once a year. The sunset creates unique atmospheric conditions, such as the intense orange and red colors of the Sun and the sky.

The sunrise is the early morning between the appearance of a sunrise above the horizon, eastward, until the complete occurrence of its disc above the horizon. The sunrise must not be confused with the early morning moments, which are called aurora and the morning twilight, during which light begins to appear. Since the refraction of the light makes the sun's disc visible before its actual presence on the horizon, from an optical point of view both sunrise and sunset are optical illusions. The Sun's optical illusions are very similar to those generated by the moon.

The hours of sunrise and sunset vary throughout the year and are also affected by the viewer's longitude and latitude, altitude and time zone. These changes are caused by the axial inclination of the Earth, the daily rotation of the Earth, the motion of the planet on its annual elliptical orbit around the Sun, and the Earth and Moon pair revolutions, one around the other.

As far as the colors are concerned, while a ray of white light coming from the Sun travels through the atmosphere to an observer, some of the colors are scattered from the ray by the molecules and the particles in the air, changing the final color of the ray which the observer sees. Because shorter wavelength components such as blue and green are spreading more strongly, these colors are almost completely removed from the rays, leaving just the longer orange and red wavelength for the human eye to see/observe. Red sunlight can be scattered by cloud drops and other relatively large particles to illuminate the red and orange horizon. [2]

2.2. The Azure of the Sky

Long ago it was supposed that the azure of the sky was due to the spreading of white sunlight on certain scattering centers in the air. John Tyndal estimated in 1868 that these centers should be dust particles and water vapor in the atmosphere.

In 1870 Lord Rayleigh showed that these centers should actually be air molecules (nitrogen, oxygen, carbon dioxide, argon, etc.)

While passing through the Earth's atmosphere, light interferes with the component gases (especially nitrogen and oxygen, which together make up 99% of the atmospheric gases), and thus the phenomenon of light diffusion occurs. The most pronounced interaction occurs in the case of light which has the smallest wavelength (purple, indigo and blue), because the wavelength is closer to that of the molecules of the respective gases. This way, the violet and blue light is reflected from one molecule to another, appearing to come from everywhere (diffuse light), which makes the *sky to be seen in a blue color*.

Why isn't there a visible violet sky, as well?

The color of the sky is blue and not violet because the Sun emits the blue color at a higher intensity and our eyes capture this color more effectively. [3] The eye contains three types of cones that make us more sensitive in what concerns the central area of the visible spectrum.

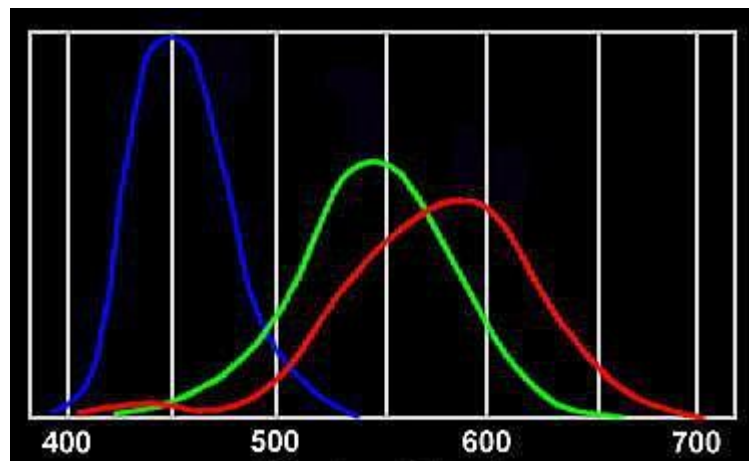


Fig.2: Different sensitivities of cones in blue, green and red

If there were no indigo and purple in the scattered light, the sky would have been a slight tint of green. But the presence of these two colors stimulates blue and red cones as much as possible, so these colors appear blue with a red hue. The net effect causes the red and green cones to be stimulated equally by the light of the sky, with blue cones being stimulated the most. This combination produces the subjective impression of a blue color of the sky. [4]

2.3. Rainbows

The rainbow is an atmospheric optical and meteorological phenomenon that is manifested by the appearance in the sky of a spectrum in the shape of a colored arc whenever the sunlight refracts in the water droplets in the atmosphere. Most frequently, rainbows appear after the rain, when the sun is near the horizon.

Three physical phenomena are involved in the formation of a rainbow: refraction, reflection and dispersion of light.

The rainbow can be explained by looking at the light rays in a transparent sphere. The white light from the sun first suffers refraction at the entrance in the drop of water, at which point the separation of colors begins.

On the opposite side of the drop there is a reflection at the interface between water and air (some of the light comes out, but it does not produce the rainbow effect). After that, the light comes out of the drop through a second refraction that enhances color separation (Fig 3) [2]

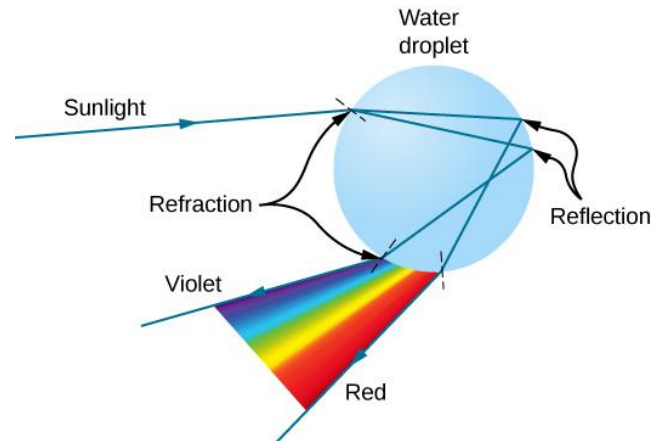


Fig.3. The formation of rainbow

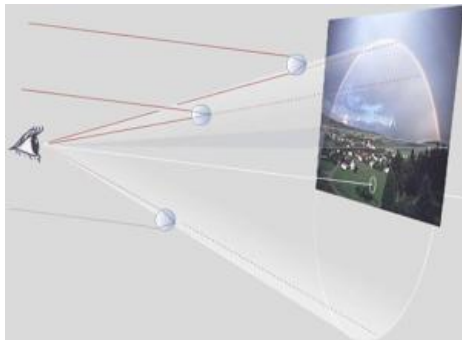


FIG.4

The arc shape of the rainbow

The sun, the eye of the viewer (taken as points) and the center of the arc of the rainbow are concentric, on the same line, which is actually the axis of a cone. If a constant angle is maintained between this line and a ray of light, the surface of a cone is obtained. The rainbow is a circle arc obtained by cutting it. Not all the water droplets on which sunlight is reflected are included in this section, some being closer, some more distant. The sensation that the rainbow is in the shape of a cone section is given by the fact that the angle between incident rays and those that reach the eye of the viewer is the same and equal to the cone's angle. Fig.4 [4]

The fiery rainbow

A spectacular and very rare phenomenon occurs when the sun is more than 58 degrees above the horizon. Solar rays pass through the translucent upper clouds made out of hexagonal ice crystals. The light enters through the side and comes out of the ice crystals, and if the crystals are optimally oriented, the result is the one shown in Fig.5. [5]

2.4. The Halo

The halo (often called *aura*) is a bright, multicolored ring that can appear on the heavenly vault around the Sun or the Moon under favorable atmospheric conditions. It occurs because of the reflection or refraction of light in ice crystals that are present in high altitude clouds (cirrus clouds).

Many are close to the sun or moon, but others are somewhere else and even on the opposite side of the sky. They can also form around artificial light, in very cold weather, when ice crystals called "diamond dust" float in the nearby air. The special shape and orientation of the crystals is responsible for the type of halo observed. Light is reflected and refracted by ice crystals and can be divided into colors due to dispersion.

Crystals act as prisms and refracting mirrors, reflecting sunlight between their faces and sending light rays in special directions.

The intensity of the halo depends on the size of the ice or water particles that cause them. It is known as the "crown", but it is not to be confused with the scattered thin light gas that is the sun's own crown. The phenomenon predicts bad weather in the next 48 hours, strong winds, strong rains or high temperatures. [2]

2.5. Mirages

The mirage (or Fata Morgana) is an optical phenomenon due to the deviation of light rays when passing through a non-homogeneous environment, in particular through layers of air at different temperatures.

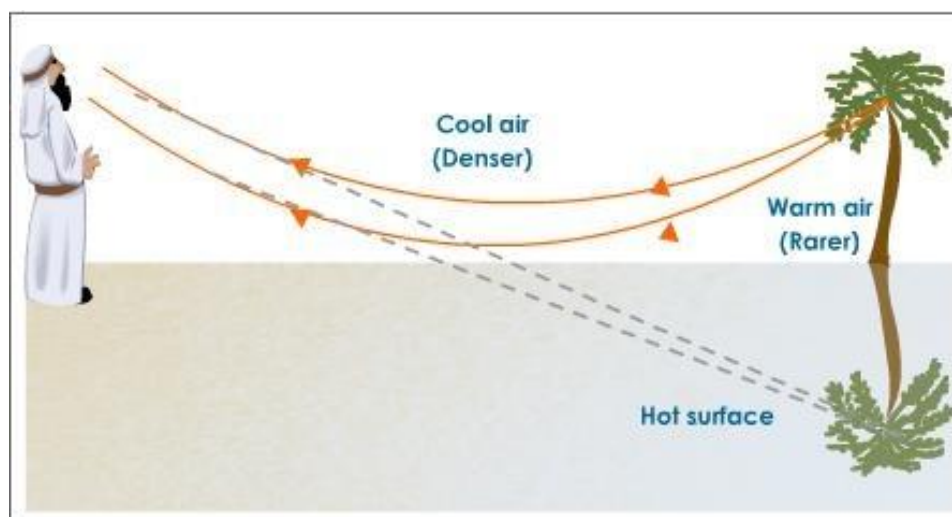


FIG.6

The *inferior mirage* (Fig.6) consists of seeing a reflection of objects near the ground due to the warming of the soil. The closer we are to the ground the hotter is the air layer, which has a lower refractive index.

Then a beam of light passing through the air layer propagates faster in the vicinity of the soil and slower as the air layer is farther away from the ground.

Under normal conditions, the air temperature drops by 6.5°C per km as the altitude increases. A temperature inversion occurs when a layer of hot air climbs above a layer of cold air. In these conditions, usually in the northern waters, one can see a superior mirage. [4]

2.6. The Polar Aurora

The *polar aurora* is an optical phenomenon consisting of an intense brightness observed in the night sky in regions in the proximity of polar zones as a result of the impact of solar wind particles in the Earth's magnetic field. When it appears in the northern hemisphere, the phenomenon is known as *boreal aurora*, a term originally used by Galileo Galilei, referring to the Roman dawn goddess, Aurora, and the titan representing the winds, Boreas. It usually occurs in the September-October and March-April intervals. In the southern hemisphere, the phenomenon is called *austral aurora*. This phenomenon is not only terrestrial, it is known to occur on other planets in the solar system as well, such as Jupiter, Saturn, Mars and Venus. At the same time, the phenomenon is of natural origin, although it can be reproduced artificially by nuclear or laboratory explosions.

The aurora typically appears both as a diffuse glow and as an expanded curtain in horizontal space. Sometimes springs are formed that can change their shape permanently.

Each curtain is composed of a series of parallel rays which are aligned in the direction of magnetic field lines, suggesting that the phenomenon occurring on our planet is aligned with the Earth's magnetic field. Also, the variability of some factors may lead to the formation of auras of different tones and colors. (Fig.7)



FIG.7 Australian Aurora recorded at 22:50 (local time) in Lakes Entrance, Victoria, Australia

Generally, the light effect is dominated by the emission of oxygen atoms in the upper layers of the atmosphere (about 200 kilometers of altitude), which produces green tones. When strong storms occur, the lower atmosphere is touched by the solar wind (about 100 kilometers altitude), producing dark red tones by the emission of predominant nitrogen and oxygen.



FIG.8

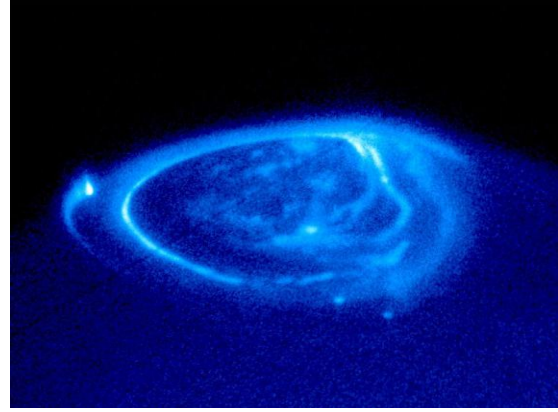


FIG.9

2.7. The Radius or the Green Flash

These green rays are a rare optic phenomenon that occurs for a very short time at sunrise or sunset and is manifested by a green spot visible above it or as a green radius gushing from the place where the sun has set. Generally, the phenomenon is observable from a low altitude in an area where observation of the horizon is not obstructed (the ocean, for example). It is caused by the refraction of light in the atmosphere: the light rays move more slowly into the dense mass of air near the ground, and the sun rays are slightly curved, as the Earth is slightly curved itself. Due to the dispersion, the top edge of the solar disk will have green-blue shades, while the lower edge of the solar disk will take red-orange shades (Fig.10) [5]



FIG.10

3. CONCLUSIONS

In summary, physical phenomena and processes which take place in the atmosphere provide a real visual show for the Earth's inhabitants, some of these spectacular light displays being visible almost daily, while others are extremely rare. Nature never ceases to amaze scientists, as both the the mysterious aura of these stunning phenomena and the unique optical properties of the atmosphere keep intriguing and astonishing them. Living on a planet with such endless natural richness, man felt the need to express his admiration for them as well as the urge to unravel their mysteries, understand and classify them using various lists and charts; and yet, most reference texts still start with such awe-struck phrases as "the most...of all...".

Thus, irrespective of how well we have come to comprehend the mechanism behind sunrises and sunsets, fiery rainbows or intense brilliant auras, in the end the beauty and magnificence of these optical phenomena, from the most common to the rarest, still have the power to boost our imagination and deeply move our souls.

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CERAMIC COMPOSITE MATERIALS IN THE AEROSPACE INDUSTRY

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Abstract: *Ceramics typically include a combination of ionic and covalent bonds to form a material with high modulus and hardness, high melting point, high thermal expansion and corrosion resistance. Because these materials may be brittle, fracture toughness is also an important mechanical property. Composites are made from two or more materials with different mechanical properties that produce a desired set of properties when combined. Self-crack-healing is an essential property of high-temperature structural ceramics for components with stringent safety requirements, such as turbine blades in aircraft engines. I want to present you a new approach for a self-healing design containing a 3D network of a healing activator. The addition of a small amount of an activator localised on the fracture path, selected by appropriate thermodynamic calculation significantly accelerates healing by >6,000 times and significantly lowers the required reaction temperature. The activator on the fracture path exhibits rapid fracture-gap filling by generation of mobile supercooled melts, thus enabling efficient oxygen delivery to the healing agent. Furthermore, the activator promotes crystallisation of the melts and forms a mechanically strong healing oxide. The healing mechanism could be divided to the initial oxidation and two additional stages. Based on bone healing, we here named these stages as inflammation, repair, and remodelling stages, respectively. This design strategy can be applied to develop new lightweight, self-healing ceramics suitable for use in high- or low-pressure turbine blades in aircraft engines.*

Keywords: *ceramic, composite, turbine, engines, self-crack-healing, activator*

1. INTRODUCTION

Composite materials have been widely used in aerospace engineering owing not only to a broad range of physico-mechanical and chemical characteristics but also to the capability of directed change of their properties in compliance with structural assignment.

The current definition of composite materials is formulated as follows : composite materials are essentially volumetrically formed special combinations of two or more components, using the advantages of each component[1].

At present, studies of composite materials belonging to three main categories are in progress : dispersion-strengthened, particle-strengthened and fibre-reinforced materials. Whatever the material, a composite is formed by a matrix (binder) of a low-modulus material and reinforcing elements with strength and stiffness properties 10 to 1000 higher than those of the matrix.

Because this paper is focused on ceramic composite materials, I am going to discuss this type of material. A ceramic is an inorganic compound, non-metallic, solid material comprising metal, non-metal or metalloid atoms primarily held in ionic and covalent bonds[2]. Ceramic may be used as matrix, as fiber or even both in the same composite.

The most popular ceramic composites in aerospace engineering are known as CMCs (Ceramic Matrix Composites). CMCs are finding increasing application due to their intrinsic advantages, such as temperatures resistance up to 260°C higher than nickel alloys at just one-third the weight. They are mostly used in military aircraft, commercial aircraft, helicopters and business jets[3].

In terms of component type, static components are the largest segment of the CMCs market in aircraft engines such as shrouds, combustor liners and exhaust nozzles[4]. They are also used in moving components, for example, in the manufacturing of turbine blades.

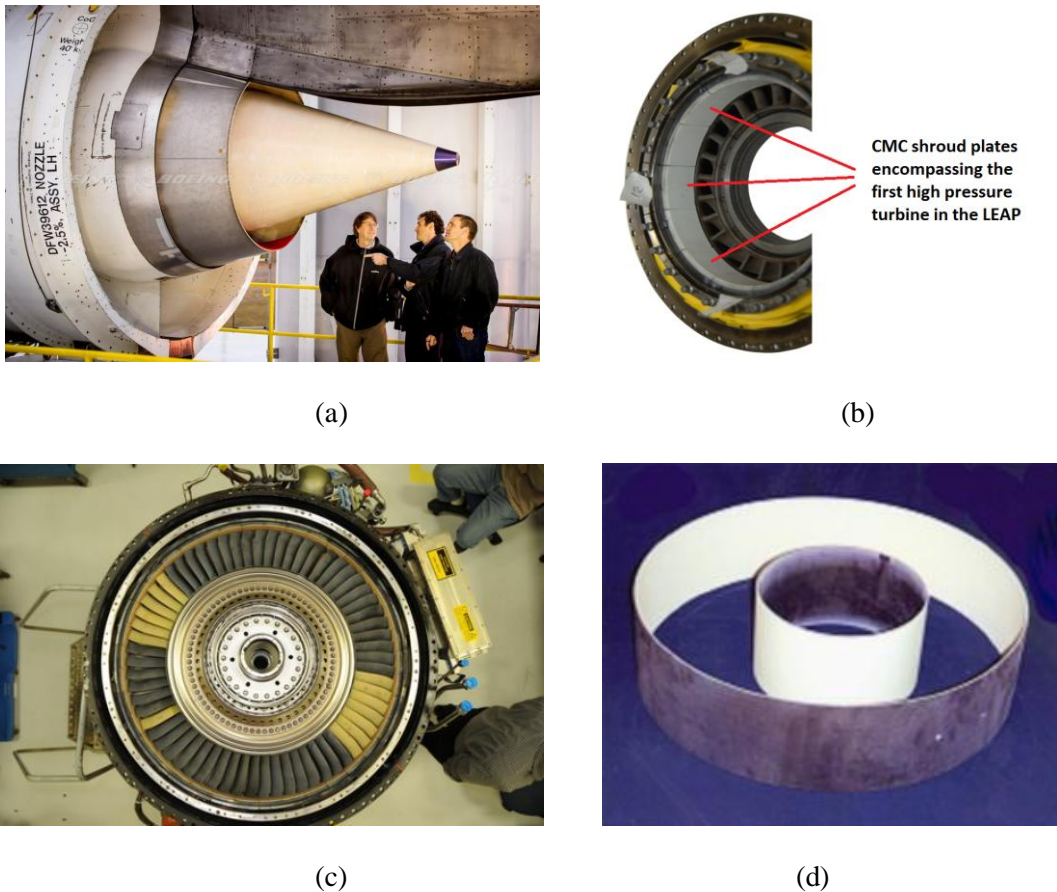


FIG. 1. CMC components (a) exhaust nozzle, (b) turbine shroud, (c) turbine blades, (d) combustor liners

In this particular case, of moving components, the risk of catastrophic foreign object damage increases and consequently unpredictable lifespan limit the application of most monolithic ceramics in high-speed rotating blades operating at high temperatures.

2. IMPROVING CERAMIC COMPOSITES

Strategies that confer self-healing properties may extend the applications of ceramic materials. Notably, biomechanical structures, including compact bones in humans, are long-lived and highly reliable, albeit brittle components. This reliability is attributed not only to reinforcing architectures, but also to their self-healing ability and capacity for full recovery from injuries. Self-healing consists of ordered but overlapping stages, including inflammation, repair, and remodeling[5].

Recently, there have been many attempts to imitate self-healing in structural materials, such as polymers, concrete, and ceramics. In high-temperature structural ceramics, self-healing is often achieved by oxidation reactions that occur at high temperatures or that exploit environmental conditions. In this approach, a non-oxide ceramic with high strength and high oxidizability in the environment in which it is used, referred to as a healing agent, is compounded into the oxide ceramic matrix. In this system, the non-oxide healing agent is protected from oxidation by the oxide ceramic matrix. Damage exposes the healing agent to high temperatures or to the atmosphere, thus triggering an oxidation reaction that fills and bonds the damaged surface, allowing autonomous, complete recovery. This strategy has been implemented using silicon carbide (SiC) and others.

However, this mode of self-healing mimics only the inflammation stage of bone repair, and depends on healing agents with a constant and high reaction rate. We have now enhanced the already excellent self-healing capacity of an Al₂O₃/SiC composite ceramic by producing a mobile phase enabling efficient oxygen delivery, and by incorporating an additional network of healing activator. This approach significantly accelerates fracture gap filling and promotes regeneration of a mechanically strong crystal phase. We also investigated the potential application of this approach in fabricating ceramics for use as turbine blades or other components in aircraft engines.

3. SELF HEALING CERAMICS

Engineers have fabricated a new bioinspired self-healing ceramic infused with a three-dimensional (3D) network of healing activator. The healing activator was selected based on thermodynamics as described in subsequent sections (and in supplementary data). The base material was an alumina (Al₂O₃) ceramic containing 30 vol% SiC. Al₂O₃/SiC composites that effectively self-heal at high temperatures, even with constant or cyclic stress loading and at low partial pressures of oxygen[6]. In addition, the self-healed parts resist high temperatures, constant stress, and cyclic fatigue better than the base material. Elucidation of the underlying healing mechanism is expected to enable further enhancement of material properties.

Complete healing depends on the production of oxides in amounts sufficient to fill the damaged site. The minimum time to complete healing, t_{min} , depends on the oxide production rate and increases exponentially as the temperature decreases (Fig. 2). For example, a surface crack with a surface length of 110 μ m introduced by Vickers indentation heals in 1,000 h at 1,273 K, indicating that healing is impractical at this temperature (Fig.2a). In contrast, the same material doped with 0.2 vol% MnO rapidly heals at 1,273 K, and returns to full strength within 10 min, suggesting that even a small amount of MnO, a healing activator, accelerates healing 6,000-fold, and enables complete damage repair even with a simple ignition device, e.g., a gas lighter (Fig. 2b), the maximum temperature of which is equal to the temperature of gas at the front blades of a low-pressure turbine in an aircraft engine. Importantly, MnO doping does not compromise the original strength and cracked strength. Furthermore, materials with and without doping had almost the same fracture toughness: 3.2 MPa·m^{1/2} and 3.4 MPa·m^{1/2}, respectively.

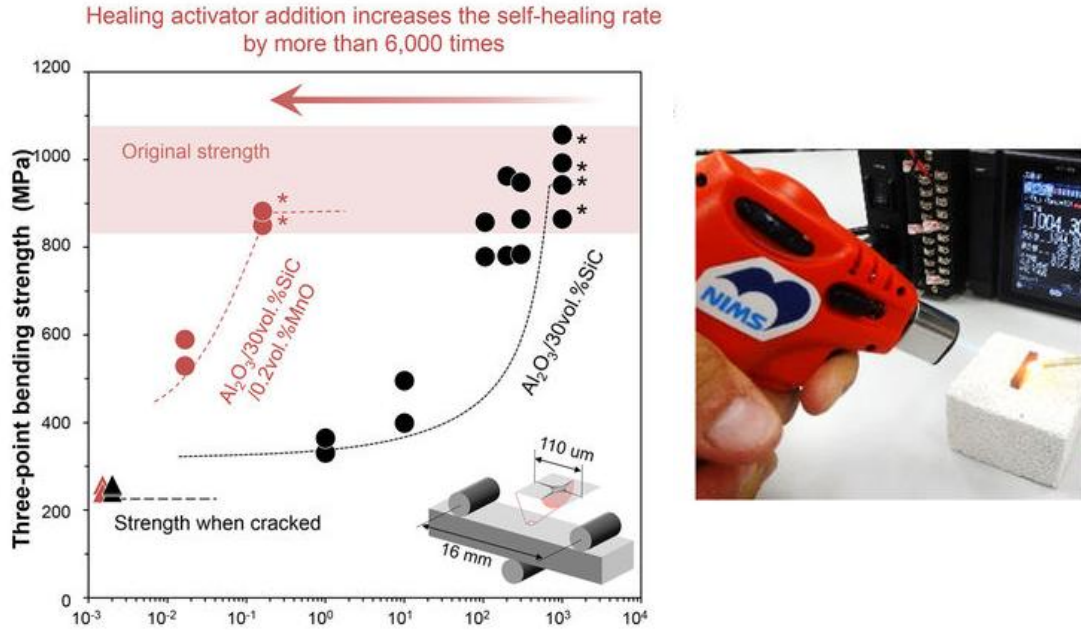
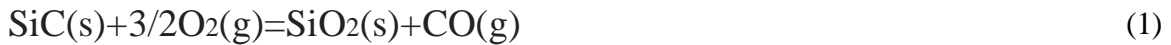


FIG. 2. Self-healing and strength recovery in Al₂O₃ ceramics containing 30 vol.% SiC and doped with or without 0.2 vol.% of the healing activator MnO. (a) Drastically increased rate of strength recovery at 1,273 K. Asterisks indicate specimens that fractured during three-point bending at sites other than the healed Vickers indentation crack. (b) Complete self-healing with a gas lighter

Materials with or without MnO are similar in SiC content and particle size, particle size distribution, alumina grain size, bending strength, fracture toughness, and other characteristics. Therefore, the healing rate in both materials should be equal if healing is due only to the high-temperature oxidation of SiC according to the following reaction:



The two materials differ in the presence of Mn-rich networks in the initial microstructure and the shape of the healing material after healing.

Insights for the rational design of new materials with a healing activator phase were obtained by investigating the healing mechanism of Al₂O₃/30 vol.% SiC. Even in MnO-free materials, oxides shaped like water droplets are observed at approximately 1,473 K (Fig. 1), at which point rapid and complete healing can be achieved. However, the glass transition temperature *T_g* of pure SiO₂ is approximately 1,500 K, suggesting that the supercooled oxide melt is not pure SiO₂. In addition, pure SiO₂ does not crystallise readily and is a strong glass with a very stable amorphous structure, which is inconsistent with the observed resistance to high-temperature fatigue stress. Thus, we hypothesized that the Al₂O₃ matrix dissolves to SiO₂ during healing to form a low-viscosity supercooled aluminosilicate healing material. Incorporation of alumina may destabilize the structure of SiO₂ glass and promote crystallisation.

4. CONCLUSIONS

The self-healing mechanism clearly indicates that dissolution of Al_2O_3 into SiO_2 is critical both to efficiently fill gaps with low-viscosity supercooled melt and to deposit reinforcing crystals that contribute to full strength recovery. Inspired by bone healing, we divided this mechanism into three main stages, defined as inflammation, repair, and remodelling stages, respectively (see Fig. 3a–c). Thus, by appropriately designing and incorporating a healing activator that promotes these processes, it is possible to further enhance self-healing.

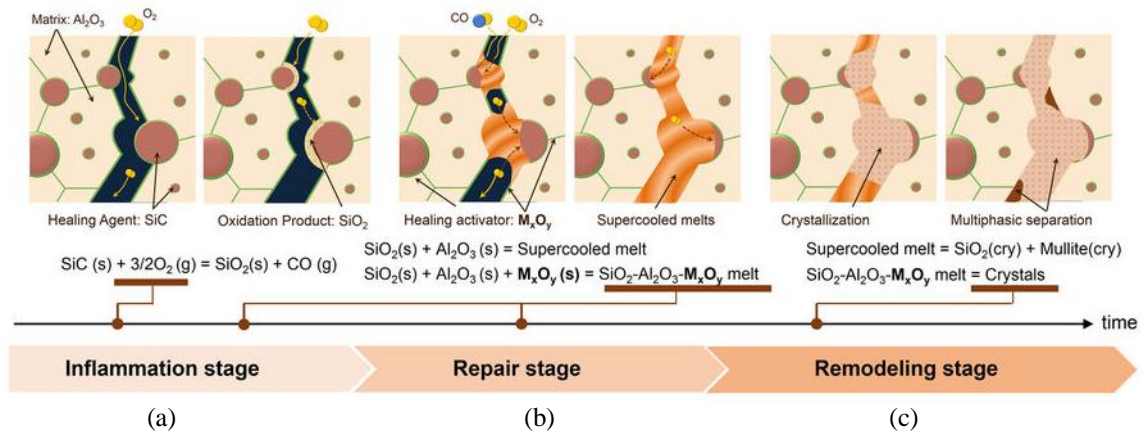


FIG 3. Self-healing mechanism for full strength recovery in ceramics

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