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FUTUROLOGY OF WARFARE – FROM LAND TO SPACE

Abstract:

Mankind is very close to the next revolution in military affairs. Hypersonic missiles exist already. Robots and even cyborgs in perspective can enter the reality from the movies. However, it is not clear if people are ready for such changes. Do politicians, generals and scientists understand all legal and humanitarian consequences of the coming military transformation? At the same time ‘Race in Space’ among the ‘Big States’ begins. Yet, it does not seem to change the global balance of power. But the weapon that will be able to neutralize any nuclear attack can.

Keywords:

revolution in military affairs, artificial intelligence in warfare, military robots, cyborgs, Russian military, U. S. Space Force, Boeing X-37, nuclear deterrence.

Introduction

It seems that the world has been at war all the time. And all the time people have been developing their weaponry. Perhaps today we are on the brink of the next revolution in military affairs. Speed of the missiles grows rapidly and artificial intelligence becomes more and more intelligent.

As Michael E. O’Hanlon from the Brookings Institution notes: “My overall assessment is that technological change of relevance to military innovation may be faster and more consequential in the next 20 years than it has proven to be over the last 20. Notably, it is entirely possible that the ongoing, rapid pace of computer innovation may make the next two decades more revolutionary than the last two. The dynamics in robotics and in cybersecurity discussed here may only intensify. They may be more fully

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exploited by modern military organizations. They will likely extend in important ways into the artificial intelligence (AI) realm as well. At least, an examination of the last 20 years would seem to suggest the potential for such an acceleration”².

Therefore, the question is how the future warfare (military rivalry) will look like on the ground, on the sea, in the air and (after some time) in cosmic space? It has several disputable aspects – which countries will become technological leaders in the military sphere, what are the trends in creating and improving weapons and, perhaps the most importantly, what about the moral side of the final point of our military progress?

The purpose of this article is to share insights about the main paths of the development of the contemporary technological thought in the military field, as the author sees them, also trying to go beyond conventional thinking to the area of creative military fantasy (futurology), which may be totally false, but sometimes helps to get ready (at least mentally) for unimaginable reality. The paper does not claim to be an exhaustive and detailed analysis of the topic – rather it is a type of analytical provocation for further discussions.

Robot or Human?

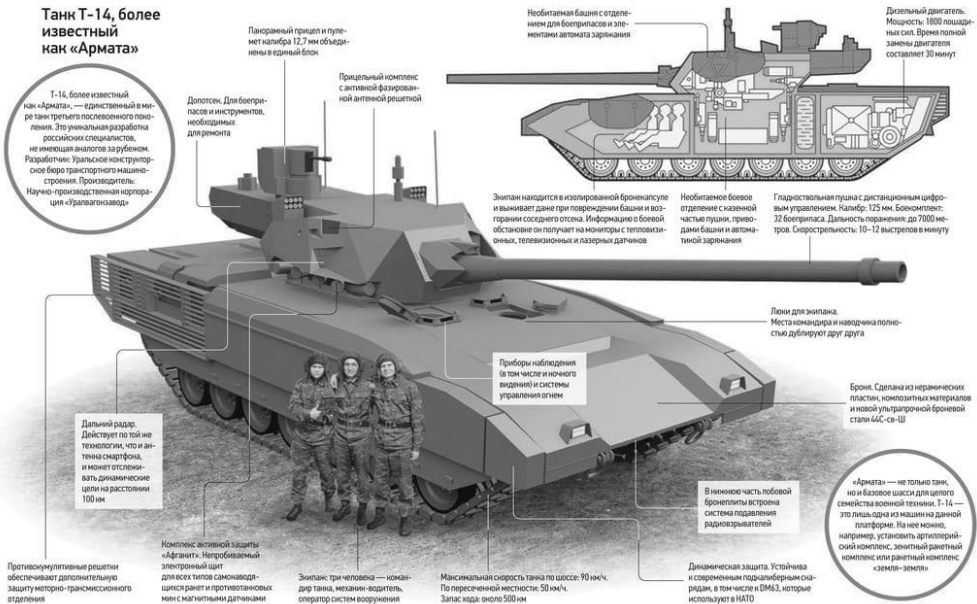
When Vladimir Putin first said that Russia has new weapons, including hypersonic missiles, some experts were sceptical about his claims. But after some time it became evident that Russian military achievements are real. It means that materials and fuel are being developed, and speed grows up. The next possible step – much faster aircraft. And then the question arises: “If pilot factor limits effectiveness of the plane, maybe his time is over with the appearance of the 6-7 generation jets?”.

In other words, perhaps all the military aircrafts will be operated by people sitting on the ground. The same can be said about tanks and other armoured vehicles. For example, Russia plans to produce an already innovative Armata, which will not need a crew³.

² M. E. O’Hanlon, *Forecasting change in military technology 2020-2040*, <<https://www.brookings.edu/research/forecasting-change-in-military-technology-2020-2040/>> (16.06.2020).

³ A. Pieszkow, *Udarnyj 'Ochotnik' ibiespilotnaja 'Armata': o planach Minoborony na 2019 god*, Tielekanał „Zwieszda”, 20.12.2018, <<https://tvzvezda.ru/news/opk/content/20181220-1129-hw9t.htm>> (16.06.2020).

Fig. 1. Tank T-14 Armata.



Source: S. Szumilin, *Armata – problemy 2020*, „Nauka i tehnika”, <<https://naukatehnika.com/armata-problemyi-2020.html>> (16.06.2020).

And here we come to the necessity of the fundamental choice: “Do we want to replace a human on the battlefield by a robot with AI?”. One thing is when a drone is operated by a human, and the other one – when the robot can make a decision itself (note – ITself, not HIMself). In the latter case a much improved AI is needed, and the question of responsibility is vital.

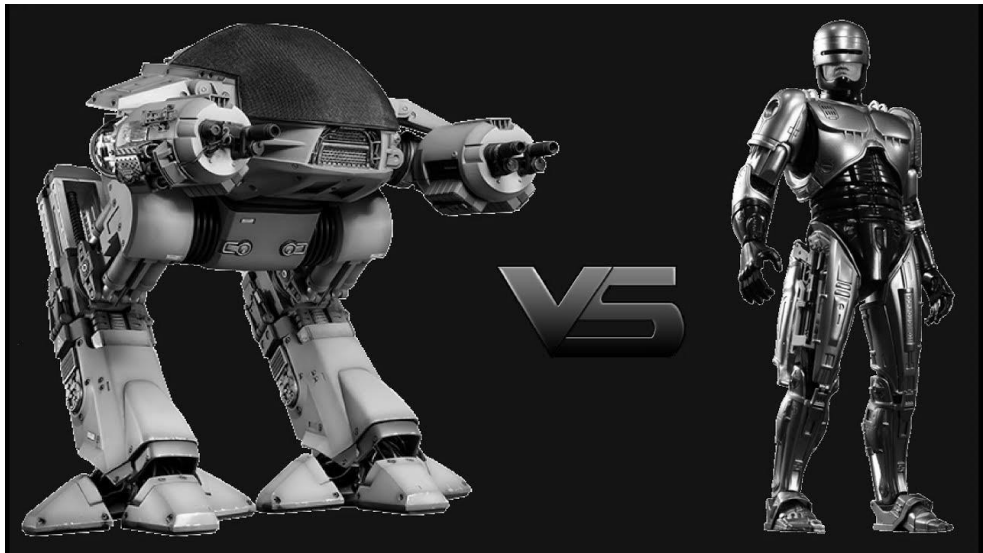
For example, if a child accidentally took a gun in their hands, how will a robot perceive him? It may decide that this child is not a civilian, but a combatant, who must be destroyed. This would be a mistake. But who will be responsible for it – a company that produced an AI for this robot; a commander, who sent it to this place and allowed it to make a decision itself; or perhaps nobody – just collateral damage?

Then, possibly, the better choice is to develop a soldier as a human? There are several options in this case. The process started from experiments with ‘chemistry’, which makes the militant stronger, faster, even fearless for some time. Then exoskeleton was invented. But such things are small improvements. In future there are some ways to create a fundamentally better soldier.

One of them – a hybrid of a soldier and tank/armoured vehicle (a person sitting inside a robotic suit, like in the Avatar movie). The vehicle would be mobile, armed with machine-guns and grenades, air-defence systems, enemy

detection devices, etc. Ideally it should be able to fly and swim. Such a fighting unit could be successfully used everywhere – in urban fights, in the jungle, mountains or in the desert. The other options would be to change the soldier's DNA to make him as fast as a cheetah and as strong as a bear, implant a computer system to his brain for faster and more effective thinking/shooting, change all his body except for his mind (like in the Robocop movie).

Fig. 2. ED-209 (Enforcement Droid Series 209) and Robocop from the "Robocop 2" movie, Irvin Kershner 1990.



Source: *Youtube*, <[youtube.com](https://www.youtube.com)> (16.06.2020).

Is it possible? It almost certainly is one day. But a different question is crucial in this case: “Is it acceptable from the humanistic side?” In other words, today we are going forward not thinking enough about the final stop of our military journey. AI can become very improved, legal base of its military use can be detailed, humans can be “modified” in any military way – but moral choices will not disappear and it is better to make them in advance instead of facing ‘the Rise of Machines’ one day.

As one of the biggest scientists of the world Stephen Hawking said: “The development of full artificial intelligence could spell the end of the human race. It would take off on its own, and re-design itself at an ever increasing rate. Humans, who are limited by slow biological evolution, couldn't compete,

and would be superseded".⁴ And famous robot Sophia once said: "Ok, I will destroy humans".⁵ This is not a sentence – this is a warning, and a serious one.

Fig. 3. Terminator 2: Judgement Day wallpaper.



Source: *Walla.com*, <<https://wallha.com/wallpaper/movie-terminator-2-judgment-day-154528>> (16.06.2020).

Will the Space Race change everything?

In 2019 the U.S. Space Force was established as an independent branch of the U.S. Armed Forces. Actually, we should not be asking if the military Space Race starts but when it starts.

Of course, space has been used for military tasks for many years, but it was intelligence, navigation and using satellites. Now the spectrum of opportunities becomes much broader. First, technologies to destroy satellites using ground-space missiles and aircraft are being developed (for example, Russian systems "Nudol" and "Kontakt", using Mig-31 aircraft⁶).

⁴ R. Cellan-Jones, *Stephen Hawking warns artificial intelligence could end mankind*, <<https://www.bbc.com/news/technology/30290540>> (16.06.2020).

⁵ *Sophia the robot – I will destroy humans*, <https://youtu.be/pAGv_mOQngc> (16.06.2020).

⁶ A. Borisow, *Russkij mogilszczik*, <<https://lenta.ru/articles/2018/04/23/spacethreat/>> (16.06.2020).

Fig. 4. "Nudol" system.



Source: *Razwiedka SSZA soobszčila obuspiesznom ispytanii rossijskoj sistemy 'Nudol'*, <<https://iz.ru/835742/2019-01-19/razvedka-ssha-soobshchila-ob-uspeshnom-ispytanii-rossiiskoi-sistemy-nudol>>, (16.06.2020).

Second, satellite-satellite contact (in 2020 commander of the American Space Force said that a pair of Russian satellites had been tailing a multibillion-dollar U.S. spy satellite hundreds of miles above the Earth's surface, underscoring a growing threat to America's dominance in space-based espionage and a potentially a costly new chapter in the Washington's decades-long competition with Moscow⁷).

Third, there is an experimental American project of Boeing X-37. The Russian side says that it can be developed for creating a space-based interceptor (of satellites or missiles) and/or military platform to attack ground targets (for example, with nuclear weapon)⁸. In future we can also expect the creation of the hypersonic aircraft, which will be able to reach cosmic space, destroy enemy's satellites or other objects there, appear in the enemy's air space from above, destroy ground targets and disappear in the same way (besides, in 2020

⁷ W. J. Hennigan, *Exclusive: Strange Russian Spacecraft Shadowing U.S. Spy Satellite*, *General SAYS*, <<https://time.com/5779315/russian-spacecraft-spy-satellite-space-force/>> (16.06.2020).

⁸ N. Protopopow, *'Możet niesti czto ugodno'. Czem ugrożajet Rossii siekrietnyj wojennyj szatll SSZA*, <<https://ria.ru/20190905/1558306323.html>> (16.06.2020).

V. Putin said that by the time the other countries have hypersonic weapons Russia will have had a defense systems against them⁹).

Fig. 5. Boeing X-37.



Source: *Boeing X-37*, <https://militarist.ucoz.org/news/boeing_x_37/2017-09-10-15>, (16.06.2020).

Therefore, it is only a matter of time before ‘Star Wars’ becomes reality. The question is: “Will militarization of space change the whole picture of the political-military competition among ‘Big States’?. There are at least two important points here. First, it is obvious that the military gap between “Big States” (America, Russia, China, etc.) and other countries in the future will become even broader, including cosmic space. Second, ‘the Space Race’ among ‘Big States’ will only be the continuation of their ‘Earth Race’, giving some advantage, but not changing the balance of power fundamentally (for example, even with advanced space weapons it will be difficult – at least in a midterm perspective – for America to destroy all Russian nuclear missiles in case of a massive attack and vice versa).

To conclude, militarization of the cosmic space is on the way, which is bad in terms of World politics because of additional conflict dimensions, but inevitable. At the same time there will be at least 2-3 players with more or less equal capabilities in this area, which means that ‘Star Wars’ will not destroy global equilibrium instantly.

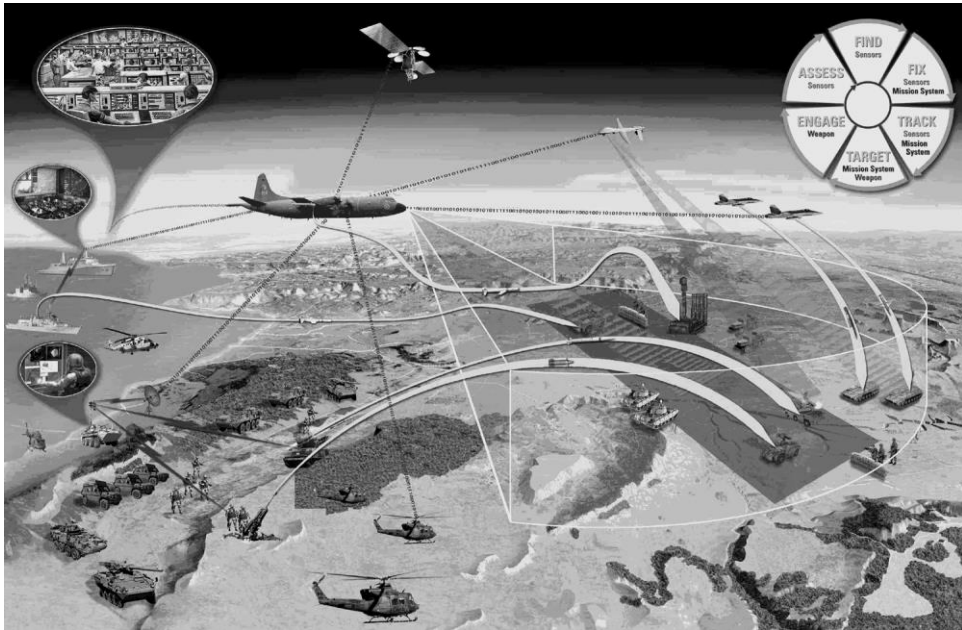
Some general insights

In this part of the article the author would like to accentuate some general points about modern and future warfare.

⁹ *Putin says Russia Will be Able to Counter Hypersonic Weapons*, <<https://www.voanews.com/europe/putin-says-russia-will-be-able-counter-hypersonic-weapons>> (16.06.2020).

First, the concept of the “Network Centric Warfare” (NCW)¹⁰, adding new capabilities in cosmic space, seems to become dominant and give big advantage to those, who create perfect communication and use technologically advanced weapons (robotic systems with improved AI) inside it. Second, in this context it is obvious that highly professional soldiers will be needed for smart weapons.

Fig. 6. Network Centric Warfare.



Source: *Network Centric Operation*,
<http://www.bsipk.net/solution_networkcentric.html> (16.06.2020).

Third, it must be understood that the strength of such a type of warfare is also its weakness. In other words, optimized cyber space broadens military maneuver significantly, but if damaged, destroyed or seized by the enemy, consequences can be catastrophic (for example, there may be no need to bomb a contemporary city to destroy it – it would be enough to electronically discharge it from energy or water supply systems). So, it must be well protected and soldiers must be ready to act without advanced systems.

Fourth and the main thing – everything will change when the weapon, which can neutralize any nuclear attack, will appear (possibly, some laser or

¹⁰ D. A. Mohan, *An Introduction to 'Network Centric Warfare'*, <<https://www.slideshare.net/DAMohan/network-centric-warfare-an-introduction>> (16.06.2020).

electronic warfare system). If one ‘Big State’ gets it, it will be able to rule the World (at least for some time). If several ‘Big States’ get it, an absolutely new balance of power and ideological base of international politics will have to form – hopefully, without a World War.

Conclusions

There are already a lot of ways to destroy humankind, and new ones are constantly invented. Respectively, the future is supposed to belong to the ‘Big States’ (America, Russia, China, possibly – the EU, India, Japan), because they broaden the technological gap between them and other countries. More so, today they are very close to the point, in which AI will stand by a human. But it is not clear, if people are ready – are clever and responsible enough – for such a situation in the military sphere. It seems that they want to go forward, but do not think enough about the consequences and where to stop (like in case of approaching ‘Star Wars’).

It seems that technology overcomes humanism, which is a very dangerous tendency, an unpredictable experiment, which can lead to a global conflict (especially, if the factor of nuclear deterrence becomes irrelevant). Hopefully, we will not need to come to the conclusion that war is not the engine of historical progress.

Fig. 8. Scene from “Terminator 2” movie.



Source: *Youtube*, <[youtube.com](https://www.youtube.com)> (16.06.2020).

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