OSCE High-Level Military Doctrine Seminar
Session 2 – Technological Change

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New technologies, new requirements, new doctrines: how defense technology is adapting to and affecting changes in military doctrines and operations

It is a two ways street. From one side the ongoing military operations bring a number of urgent operational requirements, usually linked with the goal to tackle pretty low-tech threats which, fortunately, are the main concern for the "force protection" fixed field commanders, since the enemy cannot bear anything more advanced. Good examples of such threats are IEDs (Improvised Explosive Device), snipers fire, dumb artillery rockets and mortar rounds, crude communications systems. This is typical of the low intensity but very long conflicts which had been neglected by western military thinkers for decades.

Another good example is the COIN aircraft: it is surely needed, since there is no merit in using advanced fast jet for typical counter insurgency work, nevertheless conventional air forces resist the clear operational need for such a craft. Only a few "smart" air forces are addressing this requirement "in house". I think for instance of the UAE air force, which has bought the latest F-16 variant, is considering an even more advanced Rafale, but at the same time buys nitty-gritty AT-802U fixed landing gear prop powered COIN (Counter Insurgency) aircraft.

On the other hand military planners wants to keep a technological advantage on potential conventional competitors, possibly even increasing this advantage, since many of what were at a time considered as "emerging" technologies have become widespread accessible, albeit at low levels. Stealth technology is a good pointer. UAV (Unmanned Air Vehicle) technology is yet another one. The technological edge can be increased by investing asymmetrically, as the US is doing, in military space, electronic attack, cyber warfare, net centric operations, directed energy weapons.

Another area were a lot is to be done involves the "Future Soldier", i.e. the effort to provide the land warriors, which are the basic "weapon systems" of every army, of the same "unfair technological advantage" over conventionally equipped opponents which western army enjoy in almost every other combat realm, on the ground, in the air, on and under the sea and in space.

I would also address another factor which, while not technical nor operational, is conditioning R&D (Research and Development), operations and doctrines: it is what we can define as the "politically correctness" effect. Simply stated, the international efforts to ban the use of certain weapons and technologies and to reduce to a minimum civilian casualties (and even military casualties) is having a growing impact. Think for instance about precision/smart weaponry. They were "invented" for pretty good military reasons: increasing the efficacy of the attack, by allowing a small number of platforms to engage a large number of targets using a small number of weapons, in all weather. But nowadays for political reasons smart or precision weapons are becoming almost mandatory even when there is no military sense in

using them over conventional weapons. We can see this happening lately in Libya. And for the same reasons smaller and smaller and increasingly precise weapons are required. Think of the Afghan-Pakistan air strikes. Obviously this evolution is welcomed by the defense industry, since smart weapons are more expensive than the conventional ones, while the " legally acceptable alternative" to cluster weapons or mines are much advanced and costly than the banned weapons. This is an important point…unless the military requirement for the banned weapons will fade away, which in some cases could happen, that requirement is going to be met by using different technologies and systems. And if some countries are trying to craft a legal ban on IEDs…well, this is not going to happen.

Or think about the evolved and "correct" anti tank ammunition which is required to provide the same performances of a DU (Depleted Uranium) alloy. Also, in many cases the new "non kinetic" weapons, including electronic attack and directed energy ones, are more expensive that the kinetic alternative.

Cyberwarfare is a bit different, since this is actually a new kind of warfare, which has nothing to do with political correctiveness and which is not necessarily so "unlethal" as many could think. Indeed hoping to limit cyberwarfare is even more difficult, because it can be waged both in peace as in war time and not necessarily by organization which belongs or are traceable to a state country. What happened in the very limited internet domain with the Wikileaks affair teaches a lot of lessons. Including that offensive cyber and IT warfare is much more cheaper than the defensive one.

We have just touched the subject of the "non lethal or less than lethal" weapons. Yes, they are still to be considered weapons. We have just to remind that a shied (including a missile one) or an helmet are…weapons. And a non lethal weapon is just that. A weapon which does not kill, but which obtain the desired effect by non kinetic solutions. But a non lethal weapon can became lethal, depending on how and against whom is used. We can't be nothing less than happy if we can win a fight without killing. But we have better to think that a was without casualties cannot be dreamed of.

It is also worth to note that the "politically correct" war can only be waged by very rich countries: the rest will stick to the old weapons and habits since poor or poorly developed countries cannot afford or have not access to the "nice and clean" weapons.

Back to our main theme. We can agree that technological advances are indeed shaping differently the way military operations are and will be conducted, as well as the way the armed forces are organized (and the traditional services lines are more and more blurred). This translates in major changes in military doctrines and in the way the personnel is trained and prepared for a job which can and will change.

We shall all see machines growingly replacing humans on the field. Already this is happening in the air, were UAVs, both fixed wing and rotary are numbered in the thousands, while UCAVs (Unamneed Combat Air Vehicle) are also a reality and new aircraft systems are conceived as either unmanned or optionally manned. I will not say that days of the pilots are numbered (the most since the chairman is a blue suiter), but many "pilots" in the future will routinely deploy in front of a console on the ground instead than in an aircraft cockpit. Space is already a "machine" domain. On the sea automation is making the naval vessels crew shrinking considerably and USVs (Unmanned Surface Vehicle) are already being deployed. We shall see more of that. In the underwater dimension UUVs (Unamnned Underwater Vehicle) are becoming commonspread and they will get new roles and missions as technology evolves.

Were the robotic advance is slower is… on land. This is pretty normal. Yes, UGVs (unmanned Ground Vehicle) are starting to roam the battlefields, but we are very far from seeing a robotic infantrymen. Even combat ground vehicles are still a futuristic goal. What we watch is instead the effort to improve the physical efficiency of the human soldier, by the way of powered exoskeletons. No, not a cyborg, but something in the middle, which is surely needed since …80 kg of light and advanced equipment still weight 80 kg!

And before the unmanned system will be able to replace the humans we shall wait for major breakthrough in artificial intelligence and expert systems. Indeed we have already a "computerized" general or naval captain which helps to speed up and smooth the decision making process. But machines are still as smart as we build them.

And at the end of the day this is positive. Because when there will be just machines to fight a war, then we shall probably see many more conflicts and wars erupting in the world. Because governments will be only concerned by the financial costs of a war, but no more by the constraints which are attached to the decision of sending human and voting citizens on the line of fire.