Technological developments and modern operations

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Général de corps d'armée Francis AUTRAN

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Histoire & stratégie

"One must act as a man of thought and think as a man of action." This totality ofman according to Bergson could easily suit the military leader who, not only must reason his manoeuvre in all the direct and indirect, active and passive dimensions contributing to the attainment of the strategic objective sought, but who, above all, mustact in awareness of the city's recovery once the situation has stabilized and peace has returned.

Lhe paradox of modernity

Among the factors that contribute to the success of military action are, of course, the intrinsic qualities of the soldier and his ability to command, act and manoeuvre under difficult conditions in the face of a determined enemy. But there are also the means at his disposal to anticipate the action, and then take and maintain the ascendancy over his adversary. For if the soldier must be well selected, well trained and well equipped, he must also be well equipped. And that is where technology makes its entrance on the battlefield, where it now holds a place that is both dominant and paradoxical. Indeed, while it undoubtedly contributes to the operational superiority of the units that have it, it is nonetheless a power levelling factor when its dual character makes it accessible to the greatest number. This paradox of modernity must be taken into account and managed to keep this time ahead of the opponent that gives, ultimately, victory.

In this context, what is the relationship between technological developments and modern operations?

From evolution to breakthrough, technology has always had a major impact on the design of warfare and the conduct of operations. Recent technological developments act as real catalysts for the risks of contemporary conflict, resulting in changes in relations between belligerents.

Thinking about the war of tomorrow therefore presupposes starting by identifying and fully understanding these risks in order to prevent them, if not control them, then at least contain them with the most appropriate modes of action.

The spectrum of threats is multiple and manifests itself in very varied fields. While militarised terrorism crystallises the security expectations of civil society because of its proximity, both geographical and temporal, the re-evaluation of the threat of terrorism is a major challenge.While militarised terrorism crystallises the security expectations of civil society because of its geographical and temporal proximity, the re-emergence of expressions of power by certain states reminds us of the need to have a modern, credible and flexible military tool capable of meeting the new threats with a full range of capabilities.

In this context, it is necessary to anticipate the constituent elements of so-called "modern" operations, each in its broadest sense.

A digitised world and a robotised battlefield: towards new areas of confrontation

The latest technological breakthrough dates back to the 1990s and is the result of new information and communication technologies (NICTs). The reality of digitisation of economic and societal exchanges has joined the field of military action by bringing greater fluidity of communications and networking of information sensors and vectors of action.

In this digitised world where all the players, whether individuals, organisations or States, are interconnected, a considerable mass of information and data is constantly being generated with extremely variable degrees of interest. It is now a matter of having the capacity to process it in order to understand **situations** and discern the key **elements** so as to be able to anticipate the intention of the **adversary** and thus successfully manoeuvre all the **kinetic and non-kinetic** , direct and indirect means at our disposal. More than ever before, cyber-conflictuality is a reality that illustrates the global and wide-ranging nature of defence action.

Moreover, the classical battlefield, in its four dimensions, is no longer the exclusive field of engagement of the human combatant. The soldier manoeuvres today with mathematical data analysis models and alongside uninhabited robots in the air or on the ground, passive or active, mobile or fixed. Modern operations have reached a stage where they have moved from mechanization to robotization. **Preserving the** human combat potential and **identifying** to act with **precision and dazzling speed in** collaborative combat, with situation sharing and optimised assignment of target handling, these are the effects sought by exploiting the capabilities offered in a world of technological change.

Finally, while new technologies have helped to speed up the **tempo of manoeuvres, they have also** brought to light the need for a more precise and efficient use of the capabilities offered in a world of technological change.Finally, while new technologies have helped to speed up the tempo of maneuvering, they have also created **new areas of confrontation** in which the notion of the balance of power is expressed in a totally different way from the one that Marshal Foch conceptualized. An "informed" or "disinformed" tweet relayed in a series of blogs can have major repercussions that can create an imbalance such that the initially constructed balance of power is reversed. A modern form of the Ems dispatch, so to speak! A cyber attack on our command systems, logistics or interconnected weapons systems would certainly limit or even annihilate

friendly action. Mastering this new space of confrontation is therefore a strategic imperative.

Quand innovation rhymes with operation

Technology now irrigates operations. The meteoric developments of recent years have been major game-changers in the relationship with each other and a fortiori in the confrontation of forces. They will continue to do so, with the result that we must constantly adapt our equipment and tactical modes of action to the possibilities offered by these technological developments. Developed in the Future Land Action document, this theme of adapting capability requirements to changes in the threat and integrating technological progress is a key element of the European defence policy.in the development of these capabilities naturally directs thinking towards innovation and its fields of application. Equipment, but also its support and associated logistics, are the first to benefit from the prospects offered by new technologies.

Innovative innovation incubators

Science and progress historically found their moral and financial support within state structures. Today's world is in the process of freeing itself from this rule. The GAFA1 are a perfect illustration of this. With their tens of billions of euros of annual investment in research and development (R&D), these conglomerates have been able to grow in a globalised world by making the most of information and communication technologies. In terms of innovation, they are now ahead of the States and their defence tools in many areas.

The resulting commodification is in fact leading to wider and less controlled access to these new technologies. So much so that military game-changers no longer originate solely from the R&D of defence industrial and technological bases. It is a question of being able, in a very short space of time, to identify and understand them in order to master their implications and potential uses in future commitments. This interaction of mature dual technologies with military capabilities must therefore be exploited with agility to make them rapidly operational and integrate them into our equipment in service.

New prospects

At the same time, it is vital to maintain an investment effort in defence R&D to stay in this race for innovation from which the State cannot be absent. Indeed, it is essential for France to maintain its technological advantage at the top of the R&D spectrum. Very high-tech fields such as artificial intelligence, robotics and neurosciences, for example, will create the tools for its superiority in the coming decades. The collaborative info-enhanced combat, implemented by the SCORPION Joint Battle Group (JBG), will be a concrete expression of this for land forces. Connected object warfare is already a tactical reality with real strategic stakes. The systematic use of UAVs and land robots to complement human action must be considered with ambition to preserve the combat capability of the forces involved.

The acceleration of decision-making loops by means of faster communication systems, or the improvement of decision support algorithms drawing on their raw material, is a major challenge.The acceleration of decision loops by means of faster communication systems,

or the improvement of decision support algorithms that draw their raw material from big data are all examples of the application of these dual technologies, which should reinforce the more traditional factors of operational superiority, while contributing to the resilience of our systems.

It should be noted that these same technologies will continue to provide the adversary with levelling capabilities and will finally dispel the fantasy of technological omnipotence.

Other breakthroughs are in the offing, such as nanotechnologies, which are promising and whose first translations can be glimpsed, but which are still today out of reach of mass military application.

Lhe battle of modernity is also won at the back!

SCORPION's contact combat performance, imbued with the most modern and mature technologies, goes hand in hand with the imperative need to create the conditions for effective support of the weapon systems that operate them. Indeed, the need for endurance of future equipment engaged in conflicts that are just as demanding as today requires us to have high-performance support systems that are also capable of capitalising on technological developments.

The development of the historical know-how of the French Army in the light of technological developments is based on multiple levers, including the maintenance of land equipment in operational condition (MCO).

It therefore takes on a real strategic dimension, particularly before engagement, by contributing to the operational effectiveness of the land forces.effectiveness of forces by reconstituting critical capabilities, but also has a tactical dimension by contributing to the agility and efficiency of forces.

endurance of land forces by maintaining the required level of equipment availability. The acceleration of the operational tempo generated by info-enhancement must therefore logically be accompanied by an acceleration of the support loops and processes of the land-based MCO.

Among the areas for progress in the land-based MCO modernisation effort, which are included in a strategic plan for 2017-2020, there are four that are of real interest in the light of current or foreseeable technological developments.

Predictive maintenance using the HUMS2 process is promising; however, it needs to be perfectly supervised and adapted to specific military needs. Likewise remote maintenance (reach back), with all the limits linked to the capacities of communication media. Both potentially contribute to maintaining the tempo of the manoeuvre and increasing the availability of equipment.

Then there is the instrumentation (RFID3) for fleet management to optimise the potential of vehicles, particularly for fleets under high pressure.

Logistics spare parts forecasting is also a key area of technology use to model current consumption needs and crisis situations. Indeed, the "peacetime" estimate of equipment usage profiles rarely, if ever, corresponds to the "current" operational context, as shown by the recent use of the CAESAR guns.

Finally, the anticipation of obsolescence and technical mastery cover the vast field of collecting lessons learnt from the OSM of land equipment in external operations as well as on national territory or in operational preparation, including the exploitation of technical facts.

The transformation to the MCO-T 2025 model is therefore well under way. It must meet both the requirements of technical availability and regeneration, while anticipating the support of the SCORPION force's equipment, which is the result of the exploitation of recent technological developments. Only the maximum exploitation of the possibilities offered by NICTs, based on an integrated technical and logistical information system, will enable the full benefits of the land-based big data MCO to be reaped.

Ultimately,the relationship between technology and modern operations remains a question of measurement and balance. It lies in a fair level of mastery and optimal exploitation of technological developments, combined with prior forward thinking, so as to avoid thinking about tomorrow's war with yesterday's tools and not creating tomorrow's tools for tactical schemes that are no longer relevant. This approach makes it possible to ensure the right order of priorities so that strategy and risk assessment drive the process of taking technological developments into account in equipment, and not the other way round.

Lieutenant General Francis AUTRAN, a Saint-cyrien of the "MONTCALM" class (1980-1982) and an engineering officer, served as the first Lieutenant General of the French Army to be promoted to the rank of "MONTCALM" (1980-1982).Francis AUTRAN served from his school leaving in the mountain troops (1988- 1990), then at the Special Military School of Saint-Cyr as company commander (1990-1993). Assigned to the Foreign Legion in 1998, he took command of the 2nd Foreign Engineer Regiment in 2001. Afterwards, he joined the staff of the 27th mountain infantry brigade as chief of staff, then the army staff in 2006 as head of the Plans office. Appointed Brigadier General in 2009, he commanded the 7th Armoured Brigade and then the School of Engineering, before joining the Army Staff in 2012 as Deputy Chief of Staff Plans and Programs. Promoted to Major General in 2013, he took up the position of Deputy Director of Strategy in the Directorate General of Armaments in the summer of 2015. He is appointed Central Director of the Integrated Structure for the Operational Maintenance of Land Materiel in 2016. He has taken part in numerous operational missions in Lebanon, Bosnia-Herzegovina, Kosovo and the Republic of Côte d'Ivoire. In particular, he commanded the joint force of Operation LICORNE in 2009-2010. He is a graduate of the joint defence college and former auditor of the Centre des Hautes Etudes Militaires and the Institut des Hautes Etudes de la Défense Nationale.

1 Google Apple Facebook Amazon

2 Health and usage monitoring systems

3 Radio frequency identification

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