

## When it comes to innovation, are militaries inherently conservative?

The limits I have imposed here, are to look at the post 1945 period (defined by Hables Gray as “post-modern”<sup>i</sup>) and to ground troops as incorporating air and naval forces (and now cyber and space) would greatly extend the essay’s length. I have concentrated on the American and Russian armies as these show an interesting comparison and were the two main Cold War forces. It is my contention that both of these militaries are both conservative and innovative in different ways and neither fully achieved their potential as a result.

American attitudes to innovation can be summed up as technology driven, even that there is almost a worship of technological innovation, e.g. the development of the Cullens prongs in Normandy for countering the bocage terrain<sup>ii</sup>. Eisenhower identified this trend when he described the Military Industrial Complex which developed post-Korea where the American Army had been found to be inadequately prepared, mainly due to the post World War Two draw-down<sup>iii</sup>. Chen explains this as the increasingly incestuous relationship between the military, manufacturers and politicians, all of whom benefit from increasing defence spending.<sup>iv</sup> The obvious way to expand military expenditure without expanding the military (something that is politically difficult in times of peace or at least non-outright shooting wars<sup>v</sup>) is to spend more on each item bought. The logical way to achieve this from a PR perspective (the \$10,00 screwdriver being the best inverse example) is to buy high technology items (at least in a culture that loves technological progress).

While this high-cost procurement is a common trend, there have been exceptions such as the MICV-65/XM723/XM800 programmes (which eventually lead to the M2/M3 Bradley). Here post-Vietnam, with politicians desperate to distance themselves from the no longer invulnerable army, resulted in numerous cancelled projects (a full account of this can be found in Zaloga who includes a discussion of the controversial Pentagon Papers)<sup>vi</sup>.

American self-image was restored under Reagan who believed in weakening Russia economically through competing against a strong US military.<sup>vii</sup> Much of the technology purchased was a generational jump (in some case skipping a generation) after the cancelling of so many programmes. This was seen as a force multiplier to counter the numerous Soviet

hordes. The performance of much of this equipment in 1991 was seen as a vindication but unfortunately, many wrong lessons were learnt (e.g. the effectiveness of air-power which was much overstated in a similar way to the “Day of the Typhoon” in 1944 as demonstrated in the Balkans when air power alone could not achieve the desired effect). This is referred to by Adamsky as “tech-euphoria.”<sup>viii</sup>

In the aftermath of both the Peace Dividend and the wars in Iraq and Afghanistan it is noticeable that politicians were again seen to turn on military budgets as it was hard to justify the expense to the voting public. Overall however, the American military is keen on innovation in technology, regarding it as a “silver bullet.” Gholz and Sapolsky quote 2018 US defence research at \$75 billion a year (excluding nuclear weapons) - more than two thirds the rest of the world combined and more than the whole Russian defence budget.<sup>ix</sup> Any glance through a list of equipment in development shows the massive hype for programmes that almost as quickly were abandoned when they did not perform as expected. Examples include the Comanche, M60A2, the Advanced Combat Rifle (ACR) and XM8 programmes.

Any failure of a military or its equipment can also have a massive impact on an economy. After the easy defeat of the Iraqi Republican Guard T72/T72M/T72M1 force (which was one to two generations behind the then current production models), export sales almost ended (to the point that later models were rebranded the T90 in an attempt to attract sales). In contrast there was a surge in interest in purchasing the M1 Abrams.

American and British forces in Iraq and Afghanistan found that the equipment developed before the war was inappropriate for the circumstances they were fighting in. The Rhodesians had developed a wide range of mine-resistant vehicles and the designer had brought these to the UK after the war ended. These were offered to the British and Americans but they politely declined, seeing no operational need. From June 2003 however, the IED became the weapon of choice in Iraq<sup>x</sup>. While there were attempts to up-armour the HMMWV with improvised “hill-billy” armour it took until 2007 for a purpose designed mine-resistant vehicle to be purchased. This, despite there being models already on the market. The “not developed here” syndrome has frequently been a factor in US purchasing decisions, there being an inflexible feeling that foreigners are incapable of matching American ingenuity. The same issue also applies to items not procured through a military

programme such as the difficulties encountered by the author of the Tactical NAV software.<sup>xi</sup>

Soviet (later Russian) approaches to technology were radically different, the emphasis being on gradual evolution not radical technological jumps. For example, the T34 tank of World War Two fame was developed into the T34/85, to the T44 then the T54, next the T55 and finally into the T62 (discounting various sub versions) over a period of 30 years<sup>xii</sup>. Some radical ideas did exist (such as the Obiect 450 with a remote turret) but these were almost always regarded as too radical and not developed. In tank development the only radical new technology was the T64 which occurred after the Khrushchev era<sup>xiii</sup>. Khrushchev was no fan of high-cost army equipment (with the exception of missiles, both ATGM and nuclear), arguing for example that “if there is a projectile capable of defeating the BMP’s armour, then it would be much more reasonable to keep transporting the motor rifle troops in trucks!”<sup>xiv</sup> Once the radical T64 was developed, again the gradual evolution pattern reasserted itself with the T64 leading to the T74, T80 and T90 (via the T72 low cost “mobilisation model”). The next technological jump to the T14 seems to currently be on hold (possibly with technological issues) and it will be interesting to see Russian tank development in light of the current war in the Ukraine.

Similarly, Russian small arms have changed very little over period with the latest rifles being clear descendants of the German Stg44 (there have been a number of odd innovate developments such as double-barrelled rifles that have had at best limited use)<sup>xv</sup>. Even here, on the introduction of the AK47, the Soviets chose to also issue the self-loading SKS in case the design wasn’t mature enough for troop use. This contrasts radically with the myriad of attempted US innovations such as the ACR trials. flechette and duplex rounds and the gyrojet (all of which have been abandoned as failures when the technology has proved immature).

It is noticeable the Russian approach has not been to have all advanced equipment but instead to have a percentage of low-cost mobilisation equipment that can be produced quickly in the event of war (and often for export). Schwartz notes that even under Putin’s 2011-2020 major upgrade programme only 70% of equipment at the end would be of modern standard.<sup>xvi</sup> Add in vast stockpiles of equipment intended for recalled reservists (the

50<sup>th</sup> anniversary of the defeat of Germany saw brand new T34 tanks rolled out on the parade!) and it is clear that the Russians do not regard the latest equipment as essential.

Overall then, Russian technologies are rarely innovative instead relying on conservative development of proven equipment into new forms with little tolerance of the design bureaus radical ideas.

Command and control is an interesting area to consider, in the west, radios have dropped from company (or sometimes platoon) level in 1945 to every individual soldier today. While Russian communications have improved dramatically, it is noticeable that in the Ukraine this system has failed spectacularly when the Ukrainian phone network was degraded as many Russian secure communications piggy-backed from it! This increase has resulted in the phenomena of the general as squad leader which has been observed in person by Hackworth<sup>xvii</sup> and second hand by Griffith<sup>xviii</sup> and Bowden<sup>xix</sup>. The 1986 film Aliens (which is science fiction inspired by the Vietnam War) extrapolated this idea to the extreme of the lieutenant observing every platoon member's actions from within his APC - the integrated digital battlefield that is being touted in the West is a fulfilment of this.

This trend has shown an interesting dichotomy in that while there is a massive move towards innovation in the development of American technology there is little innovation and flexibility on how the technology is used, instead it is very incremental in utilisation.

Why then does this occur? There is a saying that generals fight the war using the methods of the previous war. There is a degree of truth in this, the junior officers of the Second World War and Korea were the senior officers of the Vietnam War with the officers of Vietnam being the senior officers of the Gulf War where their juniors became the senior officers of Iraq and Afghanistan. Their formative war experiences showing a major impact on their attitudes as generals. For example, Westmoreland in Vietnam was in the artillery during World War Two and in the paratroops during Korea. When commanding in Vietnam, he deployed the artillery in large concentrations in firebases where, although concentrating firepower, they tied down large numbers of static defence troops. He also deployed large amounts of light infantry (even if mechanised they were used predominantly in the light role, particularly airmobile). He was ignorant of the role of armour in counter-insurgency warfare. Griffiths notes the increased use of armour by the army only occurred in 1968<sup>xx</sup>

which although he does not state is the date that Westmoreland was replaced by the World War Two tank commander Abrams.

Griffiths makes a very interesting addition to this institutional memory approach, noting that it can be second hand, e.g. NATO's approach to fighting the Soviets was substantially based on German World War Two experiences. Drake (himself a former tank crewman) points out he could never forget the hordes of T34s overwhelming the superior Panthers and Tigers and felt institutionally this was forgotten<sup>xxi</sup>. I would suggest that this was due to the very different Western Front experience where, while German tanks were overrun by numerous allied tanks (and more importantly had major resupply and spares issues), the Americans and British felt inferior. This is best illustrated by the well known (if misleading) belief that it took the loss of five Shermans to destroy a Tiger<sup>xxii</sup>.

When looking at doctrine the United States is far less innovative than in technology. After the Toyota War between Chad and Libya, the US experimented with a force of light troops armed with anti-tank wire guided missiles (ATGMs). The US 9<sup>th</sup> Motorised Division developed a doctrine for the use of TOW missiles on the Fast Attack Vehicle (FAV) which was rejected as the FAV had a two-man crew while doctrine required a TOW missile team to be three strong. Despite the manufacturer developing a three-man version (the Desert Patrol Vehicle) which was used in limited numbers by Special Forces, the FAV programme was abandoned and the TOW missiles being mounted on the less agile, heavier HMMWV with their larger crew that met the existing doctrine.

Lock-Pullen argues historically America did not develop "excellence in strategy and military thought because it did not have to."<sup>xxiii</sup> He explains that this is due to the large industrial base and the luxury of distance from conflict which allows America to engage in industrial attritional warfare at the expense of manoeuvre. Adamsky notes that even during Eisenhower's New Look which recognised that nuclear weapons had revolutionised warfare, it took five years for the services' roles to be redefined (even with the radical changes such as the Pentomic Division).<sup>xxiv</sup> This even applies at a tactical level with Curry giving the example of the difficulties faced by line units in Vietnam who relied more on fire support compared to the more self-reliant airborne.<sup>xxv</sup>

Another very illuminating example of the American approach to doctrine can be found in Curry<sup>xxvi</sup>. David Chandler when Head of the Department of War Studies at Sandhurst was asked to evaluate the US Army's training aide, the commercial wargame Firefight. Chandler passed the game to Paddy Griffiths and Michael Orr. A month later they reported very unfavourably stating that it "did not include morale, training, leadership, command and control or intelligence." Griffiths was unaware that these had been removed at the request of the US military as "it was seen as un-American to offer a game for training that would include American units (sic) morale breaking and routing under pressure." In a further article, Curry also notes that the designers, at the request of the US Army changed terrain details to increase maximum ranges<sup>xxvii</sup>. These examples of a training aid being modified to suit prevailing attitudes shows an unwillingness to challenge current views.

Hackworth also gives an interesting example of lower-level tactics showing a lack of innovation<sup>xxviii</sup>. During the Vietnam War he was concerned over the training being given and as part of his investigation, discovered troops were still being trained in textbook answers that did not match the realities on the ground. When raising this he found great reluctance to change, indeed his career was ruined by his attempts to push this. In particular he criticised S.L.A. Marshall who he felt was less concerned with helping the army learn lessons but instead concentrated on the commercial aspects of his research.

Grissom observes another problem, that even when doctrine is written, it is not necessarily followed, using the example of the publication in 1993 of the US Field Manual 100-5 Operations which emphasised the range of non-traditional roles such as peacekeeping. Training and unit organisation however remained geared toward conventional warfare.<sup>xxix</sup> There is of course the apocryphal advice to junior Soviet officers not to spend too much time reading American doctrine as it was rare that the troops followed it anyway.

Perhaps the best summing up of the difficulties of American innovation in doctrine is that even the US Army's Training and Doctrine Command (TRADOC) in their official video discussing the Army Operating Concept states that they do not clearly understand some of the concepts!<sup>xxx</sup>

In contrast, Russian approach to doctrine was often highly developed. In the 1970s, the Soviets developed the theory of military-technical revolution (MTR). This was shown to good

effect in the October War of 1973 when the Israelis initially took heavy losses due to a failure to appreciate the changes in warfare and assumed their previous doctrines combined with their ability to improvise was sufficient. This contrasted with the Egyptians following their Soviet advisors' advice until politicians threw away the advantage by issuing politically expedient but militarily poor orders.

By the 1980s the Soviets developed the MTR further, something promoted by Marshal Orgakov, the Chief of the General Staff.<sup>xxxix</sup> Orgakov presided over the development of the Operational Manoeuvre Group (OMG) which had its origins in the Deep Battle Theory of the 1930s. Adamsky notes that this Soviet "new theory of victory" PRECEDED the combat experience and even the technological developments that made it possible<sup>xxxix</sup>. Boston and Massicott note that Georgia and the Crimea have refined this theory although they identify difficulties in the implementation.<sup>xxxix</sup> In my view the development of the smaller, leaner Battalion Tactical Groups in the 2000s are a logical extension of this doctrine to disperse and strike deep (the current failure of these in the Ukraine can be attributed to a lack of local allies to supplement the small infantry component as much as the logistical difficulties).

Soviet doctrine saw war as much more of a science compared to the American art. Grissom would classify this as a civil-military model of military innovation in that the innovation is guided by the civil society to which it belongs (although his argument regarding the inability of American politicians to remove military leaders ignores the removal by elevation of Westmoreland).<sup>xxxix</sup> Soviet artillery doctrine for example included fire tables giving the number of rounds to be fired to achieve harassment, suppression or neutralisation on different units in different states or positions.<sup>xxxix</sup> This scientific method strived to eliminate human variables from calculations giving the predicted outcome of a battle (similarly to the Firefight game used by the US army!). Glau quotes an example where a Soviet unit in attack wishes to destroy an enemy unit:

$$Ch = \frac{(K_{e1.i} + K_{e2.i} \dots K_{eN.i}) \cdot (1 - (Z_1 Z_2 - M))}{Kn(K_{a1.i} + K_{a2.i} \dots K_{an.1}) (L - M)}$$

(This is accompanied by tables giving values for each vehicle type for each nation)<sup>xxxix</sup>

This was in line with Marxist-Leninist thought that placed a much higher emphasis on processes than individuals.

Ironically this Soviet scientific approach grounded in political theory resulted in removing the biggest factor that can overcome military conservatism, that of allowing initiative. Instead, using unit norms that severely affected officer's career progress if they were not met created a culture of meeting targets (or at least appearing to). This also stifled innovation as officers were reluctant to take risks and not follow the formulaic answers. This was even reflected in combat with Grau giving numerous examples.<sup>xxxvii</sup>

Modern Russian doctrines have moved away from this slow, methodical scientific approach to increase Clausewitz's only advantage of an attacker -the use of surprise.<sup>xxxviii</sup> It is noticeable however that when this fails, such as in Syria or in the Ukraine, a much more slow and methodical application of firepower is revived, possibly due to the different schools of thought regarding doctrine identified by Adamsky.<sup>xxxix</sup>

Oddly one of the most effective examples of American military power was the First Gulf War when US tactics were radically different from those developed for their expected enemy, the Warsaw Pact hordes coming through the Fulda Gap. Instead, the American military found itself in an attacking posture and used a modified version of the Soviet doctrines developed for Europe (I can only assume that they were familiar with these from preparing to fight them). This massive victory caused little concern in Russian circles, indeed some felt it vindicated their tactics (although even here they noted that the Iraqi tactics were not what either NATO or the Warsaw Pact would have used, instead being those developed in the more attritional warfare Iraq had mastered in the long war with Iran).

The differences in doctrine then can best be summed up as American doctrine is almost an afterthought to match the ever developing technology (and they feel little need to actually follow it), while the Russians have an excellent theoretical knowledge showing development to allow for both history and future developments but do not have the ability to actually fully undertake those doctrines for both a lack of technology available (or even developed) and mindset to apply it outside the classroom.

In conclusion then, both armies show signs of innovation overcoming their conservatism, there is little radical development of ideas or even mature technology. Instead, the Russians developed an innovative approach to war which could not be met by their technological and command abilities. In contrast the American love of technology while



overcoming the conservative attitudes often found in the military, has shown a classic example of style over substance with limited innovation in the doctrine to accompany it. In the words of one of my instructors, "all the gear but no idea." Only in one case has the doctrine and technology been applied concurrently and the result was one of the most overwhelming victories in military history in the sands of Iraq.

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## Footnotes

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- <sup>i</sup> Quoted in Chin, Warren. "Technology, War and the State: Past, Present and Future." *International Affairs* 95, no. 4 (July 2019): 765–93.
- <sup>ii</sup> Oddly despite the vast amount of technological innovation for the landing (for example mounting London Fire Brigade ladders on DUWKs for scaling Point du Hoc), no planning or training had occurred for the fight after breaking out of the beachheads.
- <sup>iii</sup> For an account by a US Army member who fought in Korea see David H. Hackworth and Julie Sherman, *About Face* (New York: Simon & Schuster, 1990). His comments about the ill-preparedness of the initial force (Task Force Smith) are particularly illustrative.
- <sup>iv</sup> Chin, Warren. "Technology, War and the State: Past, Present and Future." *International Affairs* 95, no. 4 (July 2019): 765–93.
- <sup>v</sup> The definition of war can be problematic, legally requiring a declaration of war, technically as a result, this excludes conflicts such as the Falklands and Vietnam
- <sup>vi</sup> Steven J. Zaloga et al., *The M2 Bradley Infantry Fighting Vehicle* (London: Osprey, 1987), 3-22.
- <sup>vii</sup> Taylor Downing, *1983: The World at the Brink* (London: Abacus, 2019), 31-67.
- <sup>viii</sup> Dima Adamsky, *The Culture of Military Innovation: The Impact of Cultural Factors on the Revolution in Military Affairs in Russia, the US, and Israel* (Stanford, CA: Stanford University Press, 2010), Chapter 3.
- <sup>ix</sup> Eugene Gholz and Harvey M. Sapolsky, "The Defense Innovation Machine: Why the U.S. Will Remain on the Cutting Edge," *Journal of Strategic Studies* 44, no. 6 (2021): pp. 854-872, <https://doi.org/10.1080/01402390.2021.1917392>, 858-859.
- <sup>x</sup> Mike Guardia and Henry Morshead, *US Army and Marine Corps Mrops: Mine Resistant Ambush Protected Vehicles* (Oxford: Osprey Publishing, 2013).
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- <sup>xiv</sup> Steve Zaloga and Peter Sarson, *BMP Infantry Fighting Vehicle 1967-1994* (London: Osprey, 1997), 6.
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