



CLAWS

Artillery Lessons from the Early 21st Century

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Introduction

Today, battle experience or the experience of the artillery arm of a nation in live firing during battle is rare. Given the rarity of inter-state wars, this eventuality is not surprising. The US-led coalition forces invading Iraq during Operation Iraqi Freedom in March-April 2003, comprised of artillery from the US Army, the US Marine Corps and the Royal Artillery. Recent papers in journals such as *Field Artillery* and *Military Review* of the US or the *Royal Artillery Journal* of the UK are indicative of the many lessons emerging from this operation. The crux of the lessons emerging is that surface-delivered fire power is inescapable and needs much more attention. The operation also has a core finding that the maximum casualties to US-led forces, either in Afghanistan or Iraq, have been from mortars. From Iraq, the most fundamental lesson emerging is that indirect fires are an indispensable element of ground operations. In addition, the meaning of precision is getting erroneously mixed up with the hype of precision munitions. The insight is that when we mean precision, the target may or may not be one specific point.

While these lessons of the US and UK should be widely quoted, at home in India, we are the repository of a phenomenal amount of experience, data and records of Operation Meghdoot at Siachen (from 1984 to 2003), live cross-Line of Control (LOC) firing in the state of Jammu

and Kashmir (intermittently for nearly two decades), and the intense concentration of fires, both direct and indirect, at Kargil during Operation Vijay in 1999. These may be available with us in various forms such as after action reports; Command Post Shooting forms, target records, GPO and OP logs, sector-specific statistical data including the meteorological and other technical material; experiences of the persons involved at the gun end, as observers, commanders and staff; books, monographs, and articles in open literature and training notes or study reports in the official literature.

Trends in Application of Fire

The biggest challenge would be to sustain the same level of tacit and explicit knowledge which is available to the present batch of gunners and pass it on to new recruits. Thus, the School of Artillery and the Centres would revert to be the centres of excellence for training, combined with our most revered regimes of course shootings and practice camps. So, when the balloon goes up the next time and the gunners fire in anger, they deliver timely and accurate fire.

From decades of experience of live firing across the LoC in J&K, one trend which emerges is that we have become masters of the contact battle, in taking observed shoots in the direct and indirect mode.

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A good proportion of units were turned over in J&K and all ranks have practical experience of live firing in operational conditions. Thus, the training with live firing must be continued and the next generation must be institutionally trained in it. Due to our geopolitical compulsions and eyeball-to-eyeball deployment, the need to guard our forward localities is unlikely to decline. Manning of defences in a manner so as not to be surprised and lose ground would continue. This classical mountain warfare is a permanent feature and we need to master all aspects of it, including taking shoots with semi-active homing ammunition like the cannon-launched guided projectile (CLGP). Shoots by external pilots of Unmanned Aerial Vehicles (UAVs) of deep areas may be more in demand than shooting sorties by Army Aviation (erstwhile Air OP) due to the high attrition rates expected of the latter from ground fire and man portable air defence systems (MANPADS).

Though we may have engaged a number of enemy guns and deep targets, it would be foolhardy to presume massed fires with sufficient accuracy. Thus, the three golden ingredients of conventional indirect artillery fire need further refinement. The exacting and rigorous nature of training and technical preparation in this sphere needs to be improved. The three golden ingredients are:

- **Muzzle Velocity** - Based on a few rounds, establishing the fall of shot MV using instruments should be a function to be mastered at Young Officers (YOs) course. "Range Table MV" should not be used on every occasion.
- **Meteorology (met)** - We need to have a met intranet networked for the entire zone. The best possible met data (raw, properly fed by algorithms into the battery computer) would be a must. Sounding equipment and

material must be procured in sufficient quantities. We need to number crunch raw met data with raw ballistic data and use real time factors for obtaining corrections of the moment.

- **Survey** - Good maps, bearing pickets, artillery accuracy coordinates with differential Global Positioning System (GPS) combined with orientation need to be available with ease. Astronomy may also be needed to be reintroduced for us to understand space warfare, satellites in motion, anti-satellite weapons and so on. GPS can be doctored or denied by vendors. A non-nuclear electromagnetic pulse (EMP) may make it non-functional. In that case, astronomy would help in the necessary orientation. Surveying the target or picking up targets for the depth battle would require mastery of the locating systems, UAVs and remote sensing.

Recording Experiences for Future Use

Some facets of recording the experience of live firing pre-J&K ceasefire could be as follows:

- Updating and modifying ammunition tables with battle experiences, terminal ballistics databases on bunkers and field defences.
- We must incorporate better delay effect with our standard fuses, as also with the 105mm guns.
- Rates of fire achieved including wear and tear on guns, intense firing including changing barrels overnight.
- Stripping and moving guns by air, trucks, animals or men.
- Performance of ammunition, including premature and corrective measures.
- Sub-sector specific meteorological databases of datum shoots, witness points and surface target met including mountain range tables and similar data that can be fed and modified by users.
- Locating hostile batteries and mortars with innovation. Sound ranging equipment is now in museums but shelling and bombing reports by OPs reveal the need for training in sound ranging skills.

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- Provisioning of bearing pickets for all contingencies and regular visits to check them.
- The plans for capture of objectives.
- Digging and preparation of gun positions including alternative positions.

Training and Preparing for the Future

While devoting sufficient attention to polishing our skills for the contact and depth battle, we should also have a better working knowledge of new and emerging responsibilities, some of which are as follows:

- Taking of shoots by special forces or commando OPs including directing air effort and precision munitions.
- Given that broadband internet and mobile telephones are ubiquitous, it would be a retrograde step for gunners to not work like Signal officers. Network-centric or shooter-to-sensor warfare demands that we develop capabilities to work through bottlenecks or choke points that are created by combat net radio of the regiment, D5 and C5 nets. Contact battle is our forte and operational necessity, thus regimental and divisional corps nets would still be the basic blocks for command and control of artillery. In the contact battle, observation, communication and liaison are the bedrock and must not be interfered with. The use of fire effects for the battle, however, does merit modification.
- In the Himalayas, mules, ponies and yaks are indispensable. We cannot consign the tales of mountain and pack gunners to history. Training for the future has to deal with the centrifugal tendency of gunner diaspora to detach itself from the gunners. Similarly we “lost” the Air OP and Air Defence artillery. We must not lose our core competences such as surveillance and target acquisition including UAVs and missiles such as Prithvi and Agni. We would need to demonstrate our institutional capabilities and a culture to perform these vital artillery functions. Interestingly, in the UK, an integrated unit of SATA had rocket launchers battery as a sub unit, thus short circuiting any laborious shooter-to-sensor link.

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- We need to devote more time and gain knowledge on all aspects of surface-to-surface missiles. Our likely adversaries such as Pakistan and China have an equal, and at places, better missile force under their artillery. China is showcasing non-nuclear anti-ship ballistic missiles to counter naval ships and aircraft carriers off Taiwan, thus challenging US supremacy by their low-cost option. It is learnt that both inertial navigation and global positioning systems guide the missiles on these ships, against which there is no defence. Apart from mastering Brahmos, Smerch and Pinaka, concepts for the future must also be kept in mind. Broadbasing our education and training is vital. There is a need to have a special Long Gunnery Staff Course (LGSC) on missiles, where students could interact with personnel of institutes such as the Defence Research and Development Organisation (DRDO), Indian Space Research Organisation (ISRO) and Department of Atomic Energy (DAE). The operation of nuclear weapons as a function of nuclear deterrence would demand exacting standards for the employment of our liquid- and solid-fuelled road and rail mobile systems. Being the users and the arm most familiar with missiles, it would also be incumbent for us to understand the nuances of an effective ballistic missile defence. No single service or arm can lay a claim on it, but the gunners would need to follow closely the emerging technologies of space-based weapons, space-based force multipliers and the cyber war that can counter the best missile defence. Long-term education plans would need to be worked out for gunners to

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master the technologies associated with missile and missile defence and have most of the officers proficient with it. We also need to integrate with the Navy and Air Force in this matter.

- The time has now come for artillery to have a strategy to integrate with defence production, defence research, academia and the private sector to produce world-class equipment. It would give us self sufficiency as also earn foreign exchange. The challenges are immense and it cannot be done in a vacuum. But the next time a shooting war is declared, we should not rush abroad for ammunition and other equipment. This requires that we engage intensively with other agencies and organisations and evolve a grand strategy.

Conclusion and Lessons from Other Wars and Literature

Martin van Creveld, in *The Changing Face of War*, has reflected on the Israeli Defence Forces' (IDF) inability to use its artillery effectively in the face of Arab armies with asymmetry in numbers and weaponry. The Indian Army could probably take a few lessons from this experience. Creveld argues that "traditionally, Israeli officers have not been among the most studious in the world. Plainspoken and sometimes blunt, they have gained promotion not by writing papers but by hunting Arabs and killing or capturing them. This time, things were different." In his criticism of waffling, the author mentions that the deputy chief of

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intelligence, instead of looking for facts, sees his mission as "providing decision makers with a narrative." Also, the innovation exhibited by the Hezbollah in using old trucks as disposable rocket launchers, needs to be studied. However, their tactics of targeting civilians need to be guarded against.

The Indian artillery of the Northern Command fired thousands of rounds of varying calibers over two decades. Our experience is, thus, phenomenal, rich and unique. And while the Pakistani Artillery may also have experience on similar lines, the Chinese artillery does not. Thus, we need to do better in sustaining with realism the lessons that we have learnt during the live firing era in J&K and at the same time, prepare for the future. We need not orient ourselves to fight just the last war, but with good technical gunnery skills, we can and should innovate tactically.



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Views expressed in this Issue Brief are those of the author and do not represent the views of the Centre for Land Warfare Studies.



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