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A Study of War Technology and Tactics in India from the Earliest Times to 1947

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Abstract: Corresponding to the changing times, war technology and tactics in India have also undergone tremendous changes from the Prehistoric period to 1947. Such changes can be attributed to changes in science and technology. Likewise, wars and tactics have necessitated scientific and technological innovations. These are ongoing processes. What we now term as “Military Engineering,” was in ancient times called “acumen” or “skill”. India has shown a transition from Early Stone Age to the present times in terms of manufacture and use of weapons and tactics. Foreign invasions from time to time hastened such changes. Such technology and tactics have also led to political expansion, growth of trade and commerce and culture in general.

Key words: War Technology, Prehistoric period, Science and Technology, Military Engineering, Acumen, Political Expansion, Spread of Trade and Commerce.

Introduction:

Evolution of war technology and tactics is an ongoing process. From Prehistoric period to 1947, India has witnessed constant growth of war technology and tactics along with the development of science and technology. Both depend upon each other: technology shapes warfare and conversely, war influences technological growth. War technology combines in itself weapons, vehicles and communication systems used in war. Connected to war technology are two terms- ‘strategy’ and ‘tactics’. Strategy is the art of conducting war. Tactics constitute the art of fighting. Both are closely related but strategy is applied on a large scale whereas tactics on a small one and for a limited period of time. Both are necessary “allies” of war technology. There have been numerous instances in history when war technology and tactics have led to political expansion, spread of trade, culture and religion thus connecting the world in a better way. All these aspects hold true for India too.

Hypotheses:

- There has been an advancement of war technology and tactics over the years.
- Development of war technology has been commensurate with the growth of science and technology.

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- Evolution of war technology and tactics is accompanied by growth of trade and commerce as also territorial and cultural expansion.

Objectives:

- To gauge the importance of war technology and tactics in human history.
- To study the growth of war technology and tactics in India from Prehistoric times to 1947.
- To find out whether the development in science and technology and war technology are proportionately dependent on each other.
- To ascertain whether political expansion and spread of trade and commerce as also culture was accelerated due to the development of war technology in India or not.

Methodology:

- The project was based on historical and content analyses.
- Information was based on both primary and secondary data.
- Information was also collected from concerned people, media and internet.

To facilitate the discussion, the entire historical span has been divided into three periods.

- Ancient Period (From Prehistoric times to 1100 AD)
- Medieval Period (From 1100 AD to 1750 AD) and,
- Modern Period (From 1750 to 1947)

Thereafter, the three hypotheses have been validated one by one, period wise.

Our first hypothesis was that there has been an advancement of war technology and tactics over the years. In this context, all the three above mentioned periods were examined one by one.

- **Ancient Period (From Prehistoric times to 1100 AD)**

In the Ancient period, right from the earliest times, an advancement was seen in war technology and tactics. As Man progressed from the Palaeolithic to Mesolithic and finally, to Neolithic Age, stone and wooden tools and weapons underwent a definite advancement. They became more refined, lighter and stronger. The Metal Age to follow witnessed weapons of metal along with those of stone. During this age too, tools and weapons underwent a transition: from copper to bronze and then to iron.

The Harappan Civilization used both stone and copper weapons. It also had fortifications which remained an integral part of Indian war technology and tactics till the end of nineteenth century.



Weapons of Indus Valley Civilization

The Vedic age (1500 BC to 600 BC) showed further advancement. Chariots, elephants, iron tools and weapons were used.

Alexander's invasion in 327 - 326 BC introduced better war technology and tactics but Indians failed to make use of them.

During the Mauryan Empire (324 BC-185BC), for the first time, development of war technology and tactics took place in a definite way.

By the Gupta age, chariots gave way to elephants and horses. However, the growth of navy, except during the rule of the Mauryas, Pallavas and Cholas, remained stagnant.

Arab invasion of Sindh in 713 AD brought about a revolution in many ways. Better war technology and tactics led to the annexation of Sindh by Arabs. But till 1,100 AD, there was slow growth of war technology and tactics.

- **Medieval Period (From 1100 AD to 1750 AD)**

Coming to the Medieval Period, the advent of Turks to India introduced highly advanced and strong saddles, stirrups, horseshoe, full body armours, light swords and burning arrows. This was followed by considerable development in war technology and tactics. This trend continued in the Sultanate and Mughal periods too.



Weapons of the Medieval Period

- **Modern Period (From 1750 to 1947)**

Finally, in the Modern period also, war technology and tactics underwent

tremendous growth. A major factor was the coming of the Europeans to India from the fifteenth century onwards. The Portuguese had bigger and stronger ships and cannons. They paid considerable attention to the establishment of forts, many of which exist till date. The British, Dutch, Danes and French followed. They were quick to observe the political instability in India and with better war technology, soon outplayed the native states.

Thus, was witnessed a constant growth of war technology and tactics right from the Ancient to Medieval and finally, to the Modern period. This proved the first hypothesis of the study.

Thereafter, the study went in to examine the second hypothesis. Keeping in mind the development of all the three periods, an attempt was made to find out whether the development of war technology has been commensurate with the growth of science and technology or not.

- **Ancient Period (From Prehistoric times to 1100 AD)**

In the Ancient period, beginning from the Paleolithic Age, Man did not possess the acumen of making lighter, sharper and stronger tools and weapons. However, by the end of the Neolithic Age, with better know-how, he was able to make lighter, thinner and stronger tools and weapons.

The Chalcolithic Age saw a transition: other than stone, copper and bronze tools began to be made because Man had discovered copper and had learnt to make bronze. The latter, an alloy made with copper and tin proved to be stronger. Iron's discovery in India around 800BC revolutionized war technology. Stronger and better weapons were made.

During the Mauryan period, considerable stress was on metallurgy, iron smelting, armoury and ship building. Military engineering manifested itself in the form of various fortifications.

Under the Pallavas and Cholas, further development took place and weapons were made of best quality of steel called "Wootz Steel." Steel cutlery and weapons were exported to the Roman Empire too. The Cholas built strong and watertight ships. By 1,100 AD, there was considerable development corresponding to the growth of science and technology.

- **Medieval Period (From 1100 AD to 1750 AD)**

During the Medieval period too simultaneous growth of science and technology and war technology took place. Gunpowder introduced in India by the Mongols, was put to great use by the Delhi Sultans, as also by Vijaynagara and Bahamani rulers. Rockets called Bans (long tubes filled with gunpowder) used in the Sultanate period, continued to be an important part of warfare till the nineteenth century. The Mughal period witnessed the use of cannons and guns on a large scale. Akbar's reign saw an advancement in artillery. Throughout the Mughal period, fortifications were very important. Development in science and technology and war technology was seen in the regional kingdoms too as in the Rajput territories, Bengal, Mysore, Maratha and Sikh kingdoms. Corresponding to the global trend, Indian rulers employed mercenaries for modernization of their armies. Besides, numerous wars necessitated further technological innovations like better and lighter guns, stronger and heavier cannons, gun cleansing devices, manufacture of gunpowder and siege machines.

On the whole, Medieval period saw a neglect of navy which became a bane in future.

- **Modern Period (From 1750 to 1947)**

In the Modern period too, science and technology underwent tremendous growth leading to the development of war technology. The Mughal Empire formally ended in 1858 but the advancement of war technology and tactics continued till 1947 and beyond. It was an application of European science and technology combined with the indigenous one.



Robert Clive meeting Mir Jafar after the Battle of Plassey

Thus, the second hypothesis was proven.

Finally, keeping in mind the three periods, the third hypothesis that evolution of war technology and tactics is accompanied by growth of trade and commerce as also, territorial expansion was examined.

- **Ancient Period (From Prehistoric times to 1100 AD)**

Coming first to the Ancient period, it was seen that political expansion and growth of trade and commerce along with cultural expansion occurred due to superior war technology and tactics. The Vedic Age and the periods of the Mauryas, Satvahanas, Kushanas, Guptas, Pallavas and Cholas bear testimony to this. Indian political and cultural expansion took place in South –East Asia during the rule of Pallavas and Cholas. Even to this day, the Indian impact is very much evident there.

- **Medieval Period (From 1100 AD to 1750 AD)**

During the Medieval period too, war technology and tactics saw the accompaniment of political, commercial and cultural expansion. Better war technology made possible the rule of Turks, Afghans and Mughals. Alauddin Khilji's Deccan expeditions brought north and south India closer: they bore their impact on better trade relations, spread of Sufism and Bhakti movement and culture. Likewise, advanced war technology made territorial expansion under the Mughals a reality. At one time, the Mughal empire covered nearly the whole of India. It provided political stability to the country for nearly 332 years. Considerable development was seen in trade and commerce, religion; art and architecture, language and literature.

- **Modern Period (From 1750 to 1947)**

In the Modern period also the trend continued. European particularly British impact was very much evident. In the race of Imperialism, the British succeeded and made India a part of their empire for nearly 200 years. In course of such long rule, they influenced India in many ways, the effects being very much evident even after seventy years of Independence.

Thus, it could be seen that there has been an advancement of war technology and tactics over the years. It has gone hand in hand with growth of science and technology. Finally, political, commercial and cultural expansion has been a natural outcome of the growth of war technology and tactics.



Cannon at Danapur Cantonment

Table No. 1. Advancement in war technology in India from Prehistoric times to 1947.

Prehistoric Period	<ul style="list-style-type: none"> • Stone Tools and Weapons
Harappan Period	<ul style="list-style-type: none"> • Fortifications • Stone, Copper and Bronze Weapons • Clay Balls
Vedic Age	<ul style="list-style-type: none"> • Chariots, Horses and Elephants • Weapons of Copper Bronze and Iron
Mahajanpada Period	<ul style="list-style-type: none"> • Iron Tools and Weapons • Chariots, Horses and Elephants
Alexander's Invasion	<ul style="list-style-type: none"> • Alexander's army- • Saddles • Metal armours • Stirrups • Metal helmets • Drill
Mauryan Period	<ul style="list-style-type: none"> • Extensive war technology and tactics • Metallurgy • Iron Weapons • Elephants • Fortifications • Navy • Importance to strategy • Allies
Gupta Period	<ul style="list-style-type: none"> • Chariots lost importance • Elephants and Horses
Harshavardhana's Period	<ul style="list-style-type: none"> • High quality standard stainless steel weapons • Army and Navy
Pallavas and Cholas	<ul style="list-style-type: none"> • High Quality standard stainless steel weapons • Medical Corps • Army and Navy
Arab Invasion	<ul style="list-style-type: none"> • Burning arrows • Siege machines
Turkish Period	<ul style="list-style-type: none"> • Saddles • Stirrups • Full body armours • Helmets • Horseshoes • Good Horses
Sultanate Period	<ul style="list-style-type: none"> • Gunpowder • Cannons • Bans or rockets
Mughal Period	<ul style="list-style-type: none"> • Gunpowder • Cannons • Matchlocks • Flintlocks • Types of Guns • Gun carriages • Fortifications • Mercenaries
British Period	<ul style="list-style-type: none"> • Ordnance • Guns • Drills • Sharpnel • Tanks • Uniforms • Submarines • OR (Operation Research) • Fighter Planes

Suggestions:

War technology and tactics require constant innovations and dynamism. They are imperative for self-defence and maintaining the territorial integrity. Upgradation, efficiency and modernism instead of stagnation, inefficiency and obsolescence should be the watchwords for a nation.

Findings and validation of hypotheses:

During the course of the study all the following hypotheses were proven.

1. There has been an advancement of war and technology over the years.
2. Development of war technology has been simultaneous with the growth of science and technology.
3. War technology is accompanied with growth of trade, commerce, territorial and cultural expansion.

The major findings of the study have been :

- Invaders like Macedonians, Kushanas, Turks, Arabs and Mughals succeeded due to better and timely adoption of war technology and tactics.
- The native rulers failed to give importance to the efficiency and discipline of their armies. Instead, they stressed more upon the numerical strength which led to military failure in perilous moments of war.
- There were numerous 'Jaichands' and 'Mir Jafars' who turned treacherous and were a disadvantage for the military history of India. So loyalty of troops and citizens is very important for a country.
- We also found that unnecessary violence and bloodshed should be avoided at all costs but pacifism and cowardice should not guide our lives.

Conclusion:

Evolution of war technology and tactics has coincided with the development of science and technology in general. Political expansion and spread of trade and culture have been possible, to a great extent due to war technology and tactics. It should be remembered that technology related to war in itself, is neither good nor bad. Rather, its usage, decides its nature. Finally, in present times, considerable importance needs to be assigned to the development of war technology and tactics.

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