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### The way of achieving the battle advantage by conquering the accepted thinking pattern of ancient battlefield: From Turkana to Trebuchet

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#### සංකේපය

යුද ඉතිහාසයේ දී මිනිසා විසින් ජයග්‍රහණය අරමුණු කරගනිමින් යුද වාසිය තමන් වෙත නතු කරගනු වස් විවිධ වූ උපක්‍රමයන් භාවිත කරන ලදී. ඒ සෑම අවස්ථාවක දී ම පවත්නා පොදු සටන් ක්‍රමය අභිබවා යමින් සතුරා කෙරෙන් යුද වාසිය උදුරා ගැනීමට ප්‍රමාණවත් නවතමයක් නිර්මාණය කිරීමට මිනිසා යොමුවිය. වසර මිලියන 5 ක් තරම් පැරණි අතීතයේ සිට මිනිසා අතර සටන් ඇති වූ බවට විශ්වාස කෙරෙන අතර මුල් අවධියේ සටන් සරල ආයුධ හෝ කාය ශක්තිය මත තීරණයකට එළැඹි සටන් වූ බැව් සත්‍යයකි. නමුත් ක්‍රමයෙන් ඉන් මිදුණු මිනිසා පළමු ව ප්‍රාථමික ආයුධ ද, ලෝහ සොයාගැනීමත් සමග තියුණු මුවහත සහිත ආයුධ ද, නිර්මාණය කිරීම ඔස්සේ යුද වාසිය අත්පත් කරගන්නා ලදී. සතුන් හීලෑ කරගැනීමත් සමගින් වේගය යොදාගනිමින් පවත්නා ආයුධ වල යුද ශක්තියට අභියෝග කළ මිනිසා තත්කාලීන ව පැවති පොදු චින්තනයට අභියෝග කරමින් යුද වාසියට නව ප්‍රවේශයක් හඳුන්වා දුනි. තව ද, යුද වාසිය උදෙසා ආයුධ නිර්මාණය කිරීමෙන් ඔබ්බට ගොස් පළිහ, කය ආවරණ සහ බලකොටු වැනි ආරක්ෂක උපක්‍රමයන් ද පසුකාලීන යුද ජීවිත තුළ පොදු චින්තනයට අභියෝග කිරීමේ නිර්මාණශීලී සොයාගැනීම් බවට පත්විය. මධ්‍යතන යුගයේ ආරම්භයට පෙර පැවති දියුණුතම ආයුධයන් සහ යුද උපකරණයන් නිර්මාණය වන්නේ මෙකී බලකොටු වෙත ප්‍රහාර එල්ල කිරීමේ අවශ්‍යතාවය වෙනුවෙනි. මේ ආකාරයට මිනිසා විසින් උපයෝගී කරගන්නා ලද පොදු චින්තන ධාරාවට අභියෝග කිරීමේ කලාව අධ්‍යය 6 ක් ඔස්සේ මෙහිදී විශ්ලේෂණය කර ඇත. මෙම අධ්‍යයනය ද්විතීයික දත්ත පදනම් කරගත් ගුණාත්මක ප්‍රවේශයකින් විශ්ලේෂණය කරන ලද්දක් වන අතර පුරාතන අවධියේ සිට වෙඩි බෙහෙත් භාවිත වූ ආයුධ බිහිවන තෙක් කාලසීමාව තුළ යුද ඉතිහාසයේ සිදුවූ අවි ආයුධ සහ යුද උපක්‍රමයන් හි සංවර්ධනය මෙමගින් අධ්‍යයනය කරන ලදී.

මූලාශ්‍ර පද : යුද ඉතිහාසය, යුද වාසිය, අවි ආයුධ, යුද උපක්‍රම, පොදු චින්තන රටාව.

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## **Introduction**

When considering the battles of a certain period of time in the military history, it is visible that battle parties have used weaponry, tactics, and force handling systems which had similar features. For example, in the battles of the Akkadians and Sumerians of Mesopotamia, the Egyptian civilization, the Greek civilization, the Assyrian Empire and the Persian Empire who belonged to BC era had used similar weapons like swords, spears, shields, bows, arrows, body armor, cavalry and chariots (Newark, 2009).

Early man has produced weapons using stones and branches of trees, because they were easily accessible and easy to use (Impact Weapons, 2003 & Kouwenhoven, 1997). Secondly, man has connected these two types of raw materials was able to develop the attacking capacity of weapons (Newark, 2009). The discovery of copper and tin led to produce strong and sharp bronze weapons around 3,500 BC (Mchenry, 1992) and it was a remarkable achievement of the historic battle field. Another significant discovery of military history is the discovery of iron which assisted to produce long weapons like Roman Gladius sword (Lang, 1988) and Japanese Samurai sword (Tanimura, 2014).

A common feature that can be seen in the battle field of every historical era is that the soldiers have fought using similar kind of weapons. Though the similarity of weapons is important for the fact not to be defeated in the battle field, it does not make a significant contribution to the victory. It seems that the party that has challenged the similarity in the battle field, could achieve the battle advantage and easily reach the victory. In the early stages man has achieved the battle advantage by using primary weapons and gradually challenged the existed situations by introducing innovative tactics to gain the battle advantage.

## **Study Problem**

Military tactics and technology have been developed eventually in the military history. There are many separate discussions on each step but still a gap can be seen when it comes to the identification of the way of obtaining the battle advantage by altering the existed military knowledge. How does man challenge the existed parallel thinking pattern of military knowledge in order to achieve the battle advantage in military history?

## **Objectives**

1. To study the development of basic weapons in military history.
2. To analyze the way of achieving the battle advantage by challenging existed parallel thinking pattern.

## **Methodology**

This pure study is mainly based on secondary data which are available in published journals, books, newspaper articles and web sites. Research approach totally complies with qualitative method and analyzing system based on qualitative analytical method.

## **Results and Discussion|**

### **Stage 01 – Physical strength and the manpower challenge to primary tools**

In a study of historic military tactics and technology, the first attention goes to battles and military behaviour of primary tribesmen who lived in ancient times. Although weapons were used in the battles which happened 5 million years ago, there are no clear evidences because they were made by branches of trees or unchanged stones (Weiss, 2007). The oldest artefact ever found is 3.3-million-year-old stone artefacts discovered during 2011-2014 from Turkana in Kenya (Harmand, 2015). An evidence of that excavation is shown in figure 1.

According to the above information it is clear that the weapons used at this stage belonged to primary level. Because they were easy to produce and also it seems that the battle parties had equal approaches. Although there was an equal approach to weapons, then the military advantage of this period should be decided by the human factor. Therefore, it is logical to argue that the military advantage of the historic time period in between year 5 million and year 3.3 million was determined by the physical strength and manpower of battle parties



**Figure 1**

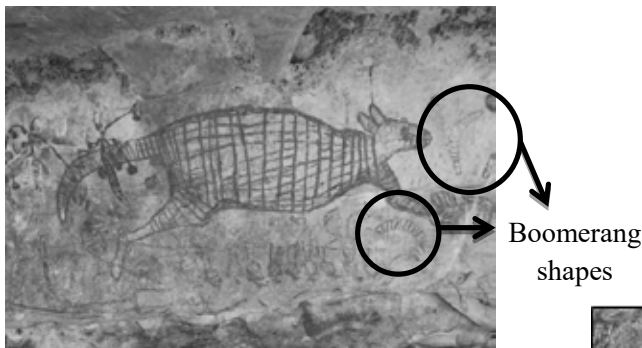
**A stone artefact found from Turkana, Kenya (Drake, 2015).**

### **Stage 02 – Defeat the enemy by primary weapons while maintaining a gap**

The second stage can be considered in between historic year 3.3 million and 3500 BC. In this phase, stone and timber parts have been used to improve the first stage weapons in complex manner (Newark, 2009). A distinctive feature in this development is that they have made weapons to attack and weaken the enemy while keeping a distance. Thus, manpower

which was the battle advantage of the first stage seems be negated and man has used this new tactic as the battle advantage of second stage. Sharpened stone artefacts, wooden long spear, stone headed spear, boomerang, bow and arrow and the throwing stick of Egyptian people can be considered as weapons of this era.

The first evidence which supports this argument is the above mentioned 3.3 million years old stone artefacts. It can also be argued that the use of this artefact as a weapon which began the trend to attack the enemy while maintaining a gap. Another evidence has been found in the Schöningen excavations in Germany in 1995; it consists of some wooden throwing spears about 400,000 years old (Hartmut, 1997). The Boomerang which was produced by native Australians is another significant weapon in this stage. According to cave paintings of Kimberley, Australia, it is clear that Boomerang has a history of 50,000 years (Parke, 2015). Although there is a scholarly view that the bow and arrow have a history of 60,000 years (New Scientist, 2009), physical evidences other than 20,000 years old Spanish cave paintings has not been found yet (Suchan, 2013). Cave paintings of boomerangs and bow and arrow are shown in figures 2 and 3.



**Figure 2**  
**Cave paintings with boomerang shapes from Kimberley, Australia. (Parke, 2015).**

With the advent of above mentioned weapons, it can be argued that the components such as the existed military advantage of physical strength and manpower were challenged and battle parties were able to attack to enemy while keeping a gap. Thus, any battle party was able to

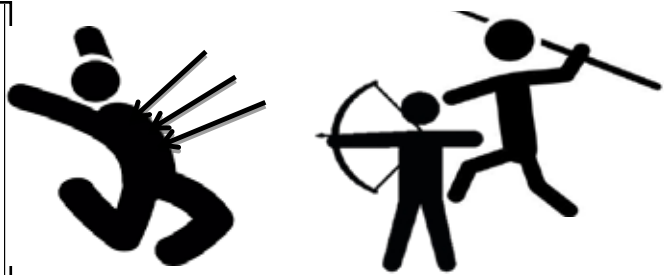


**Figure 3**  
**Use of bows and arrows in a cave painting in Spain. (Suchan, 2013)**

gain the battle advantage to attack and weaken the enemy's strength before facing the enemy. According to this study it is justifiable to consider the era when these weapons were used, as the second stage. The following figure 4 and 5 further illustrates the behaviour of these two stages in the military history.



**Figure 4**  
**Face to face battle.**  
**Battle advantage was decided**  
**by the physical strength**  
**(Designed by the author).**



**Figure 5**  
**Canceling the enemy's physical strength while**  
**keeping a gap (Designed by the author).**

### **Stage 03 - Sharpen the battlefield by metal discovery**

The third stage is unique because both above mentioned stages were challenged at this stage. With the discovery of metals, humans were able to demonstrate the following possibilities:

1. Producing deadly weapons for confronting battles.
2. Instead of weakening the enemy by keeping a gap, man was able to create weapons that could create deadly injuries.

About 8000 BC copper was discovered by humans but it was impossible to make strong weapons until the production of bronze by melting with tin (Muhly, 1985). Man has designed swords, battle axe and metal club which seem to have been used efficiently for face to face combat compared to the weapons which were mentioned in the first stage (Newark, 2009).

The first evidence of bronze swords is found from Turkey in the 3,300 BC (Oldest Swords Found in Turkey, 2013). Another weapon belongs to the era of the 3000 - 1000 BC is sickle shape Khopesh sword of ancient Egyptians (Loads, 2010). In the meantime, a military axe was produced with a bronze blade and developed the timber mace by using a bronze head (Newark, 2009). Though sharp weapons were created in this era, they did not consist of long blades as bronze could not be used to produce long blades. Few weapons belonging to this era are shown in the figures 5, 6, 7 and 8.

The study of weapons belonging to this era clearly depicts that the Armies of the third stage were able to destroy the enemy instead of crippling the enemy as in the second stage. Here, it seems that they have fixed a bronze head instead of the wooden head that has been used in the second stage weapons. This argument is further justified by the discovery of the Bronze Spear and arrow heads which belong after 3000 BC (O'Neill & Pettit, 2017). Iron technology had been discovered nearly in 1,200 BC (Duncan & Van Der Merwe, 1994) and then it was also possible to develop the weapons with a long blade.



**Figure 06**  
A bronze mace head  
belonging to 8th BC '  
(Metropolitan Museum  
of Art, n.d)



**Figure 07**  
A dagger found from Lorestan, Iran which is  
belonging to 1,350 – 1000 BC. (LACMA, n.d)



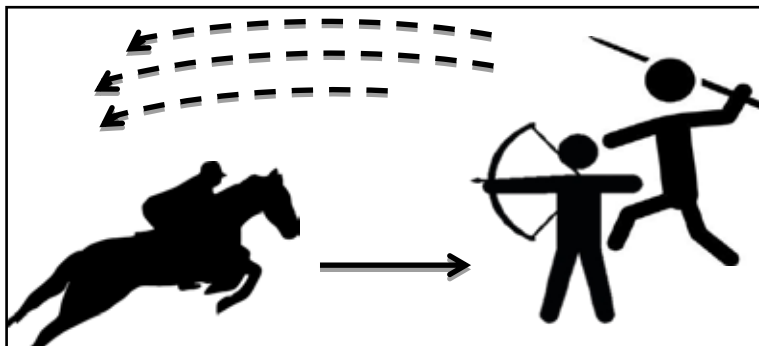
**Figure 08**  
A bronze head of a battle axe which  
belonging to 2,400 – 1,350 BC.  
(LACMA, n.d)



**Figure 09**  
Ancient Egyptians' Khopesh sword which  
belonging to 3000 – 1000 BC. (Howard, 2011)

#### **Stage 04 - Speed challenges to sharpness**

In this flow, the fourth stage is not a new weapon or a technological advancement of weaponry, but a complement for combat. It is the people's attempt to gain the battle advantage by using the speed. The man who used horses for fights was able to surprise the enemy, to avoid being beaten with a gap, and to stand stronger against the enemy in face to face battles. Figure 10 further describes the battle advantage of this stage.



**Figure 10**  
Abolish the third stage military knowledge (Designed by the author).

It is believed that the humans began the domestication of horses in about 4000 BC in the Eurasian grasslands (Metossian, 1997). The soldier who entered the battle field in horseback, designed himself simply and easier for him to fight (Nicolle, 1996). In the analysis it appears that this horseback soldier had two requirements.

1. Get off the arrows and spears from far away and reach the enemy.
2. Attack and destroy after reaching to the enemy.

Therefore, they broke in to the enemy with sharp metal weapons. Later, the soldier who became familiar with bows and arrows while riding the horse seemed to gain much advantage (Hope, 1972). But the main problem at the moment was the difficulty to assault while handling the horse and it seems that there was a need for another soldier's support to overcome this difficulty. The Assyrian soldiers' system of handling horses as a pair was one solution for the above problem (Newark, 2009). Here, one soldier managed both horses while other soldier shoots arrows on the enemy. Assyrian system of horse riding is shown in figure 11.



**Figure 11**

**A carving presenting the Assyrian horse riding system as a pair. (Assyrians, 2016)**

The above mentioned Assyrians' horse riding method had not been so successful because it has not recorded from other battle fields in the world. The successful alternative for this was the chariot which is a carriage drawn by horses. Though the wheel was discovered in around 10,200 BC, scholars believe that it was used after 6,500 BC by the people of Halaf civilization in present Northern Syrian - Turkey border (Childe, 1935). Also, the oldest evidence of a wheeled vehicle is a Polish clay pot image belonging to 3,500 - 3,350 BC (Anthony, 2007). According to available historical evidence, it can be argued that the chariots were used for battles after 3,500 BC.

In the early war stages of chariots, bulls were used to draw those heavy vehicles (Newark, 2009). But this technique was later developed to a great extent, and created lightweight vehicles, elite model vehicles, vehicles that carry few soldiers and a rider manual was also developed in about 1,350 BC (Chamberline, 2006).

The use of horses for war was gradually developed and horseback soldiers and chariot soldiers could surprise the enemy by using the speed against their previous battle advantages. The following figures are illustrated that the usage of bulls and horses in different stages of the development of chariots. A bull drawn car chariot and a two horses chariot are displayed in figure 12 and 13.



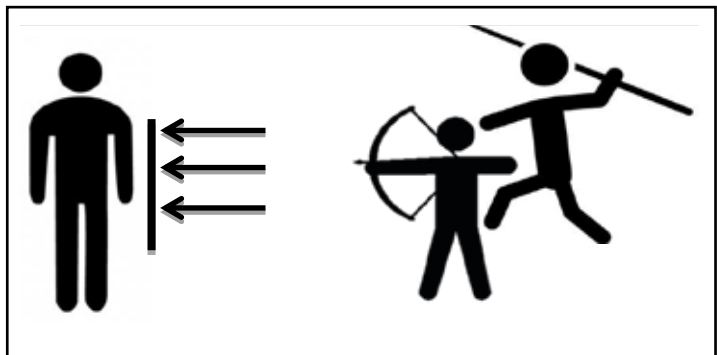
**Figure 12**  
**A model of a bull drawn car chariot.**  
**(Car chariots, n.d)**



**Figure 13**  
**Egyptian model of the two horses chariot**  
**with rider and attacker. (Egyptian pharaoh**  
**wearing armor inside his chariot, n.d)**

### **Stage 05 - Protection as a battle advantage**

In the fifth stage of this study, it appears that there was a developed complexity through the various attacking methods of the war. Since the battlefield has been surpassed by sharp-edged weapons, attacking while maintaining a gap and the speed of horsemen, there should be a fresh dimension to achieve the battle advantage against the existed methods. The new discovery for this situation was a defense strategy. The Figure 14 shows how the security has been used to face the enemy attacks.

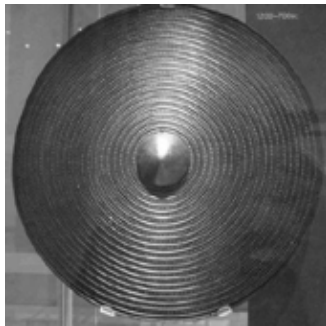


**Figure 14**  
**The need of a cover to protect from the sharpness of**  
**metals and the speed of horses**  
**(Designed by the author).**



There are evidences for the existence of two such early measures for physical protection of battle field soldiers. Wooden shield was not a successful remedy and bronze shield could not provide a proper protection from enemies' arrows. In addition to the shield, the other technique is exhibiting in a stone carving which belongs to the battle between city states of Lagash and Uma in 2,450 BC. That is a large scale plate which carried by a group of soldiers as a cover for all of them (Grant, 2011). That stone carving and a bronze shield of BC era are displayed in the figures 15 and 16.

10.



**Figure 15**  
**A bronze shield belonging to 1,200 – 800 BC (Ucklmann, 2011)**



**Figure 16**  
**A group of soldiers carrying a plate which could be cover them all. A stone carving of the battle of Lagash and Uma - 2,450 BC. (Military History Now, 2014)**

Since the shield was not a very successful defense, the alternative solution found by the historic man was body armour. The first physical evidence of the body covers is the Dendra Panoply of 1,400 BC discovered in Greece (King, 1970). Though it was full body armour extended to the knee it seemed that the uncomfortable to wear because it was a heavy armour. The Warrior Vas at the archeological museum of Athens is another evidence that showing the production of primary body armour in this era (Oakeshott, 1966). The warriors in this vase have covered their body something like a plate that does not match for the human body. In addition, Egyptians' body armour designed by small bronze buttons in BC era and the Celtic body armor designed by interlocking iron rings around 500 BC can be taken as historical evidences on body armour (James, 1993). The Dendra Panoply and the Warrior Vas are depicted in the figures 17 and 18.

According to the analysis, this stage is unique because it was the first selection of security measures against weaponry development in military history. Therefore, this stage clearly depicts that the parallel thinking pattern was challenged to gain the battle advantage.

An extension of this stage goes beyond the body covering and to the era when the thought of getting measures that were able to protect a group. These were built as the city

walls in the early stages and gradually developed into fortifications. City wall of Sesklo, Greece which is considered to belong to 6,800 BC (Stamilou, n.d), city wall of Zornitza, Balgeria which is considered to belong to 4,700 BC (BBC news, 2012) and the great wall of Brodgar found from Orkney, Scotland which is considered to belong to 3,200 BC (Ravilious, 2013) are some of the best examples for ancient city walls. Although such examples exist for the construction of city walls, it is seen that the fortifications were built later in order to gain the battle advantage as a military strategy.

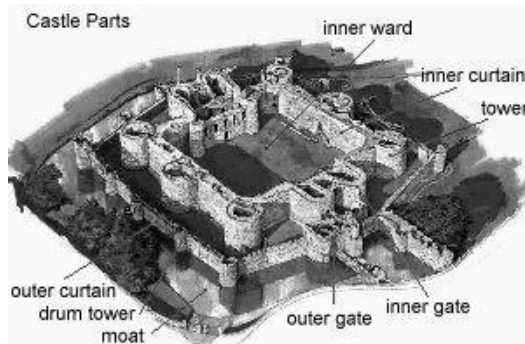


**Figure 17**  
**Dendra Panoply belonging to 1,400 BC.**  
(Dendra Panoly, n.d)



**Figure 18**  
**Warrior Vas Belonging to 1,200 BC**  
(The Warrior Vase,

The structure of a fortress consisted of a variety of security measures. Strong walls, huge gates, towers around the wall, arrow slits, outer wall, moat and the drawbridge are some elements that can be seen in a fort (Brown, 1984). Figure 19 depicts the basic structure of a fortress.



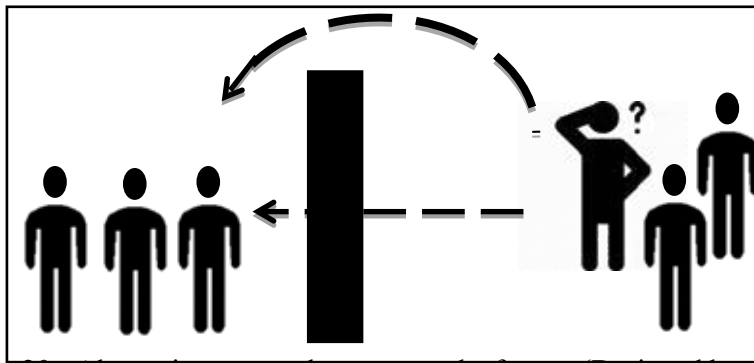
**Figure 19**  
**The basic structure of a fortress. (Castle Parts, n.d)'**

The advantage of a fortress in a battle situation is great. On the one hand, the possibility to evade the enemy in an open ground and on the other hand, the ability to annul

the destructive power of the enemy's weapons are the key importance of using fortifications in battle situations. Other than that it can be seen as an attacking tactic which has used to attack to enemy through proper observations.

### **Stage 06 - beyond the fortress**

If the next stage considered as the sixth, the most possible challenge for the human of this era was the question of how to reach the enemy who was there in the fortress. Figure 20 explains the alternatives for that question.



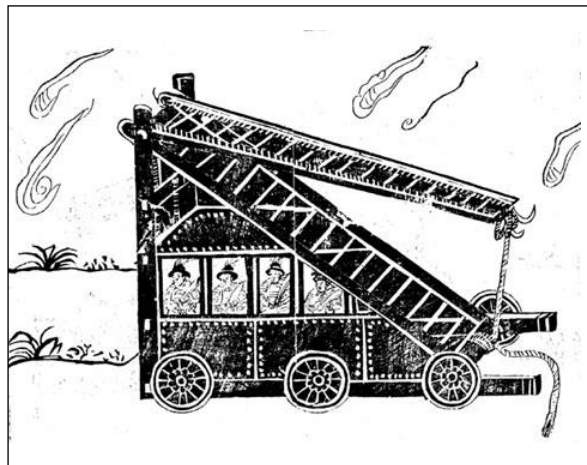
**Figure 20**  
**Alternative approaches to enter the fortress**  
**(Designed by the author).**

A unique historical proof in this regard is the Trojan horse described in the Homer's Iliad (Muller, 1984). Here, the city wall is a great barrier to Greeks forces to enter the Troy city and finally Greeks were tactically get in to the city by using a huge wooden horse (Thomas, Kypros, Stefanos & Cesare, 2015). It was the only a tactical military behaviour of the respective battle and it does not mean that the need of the era was fulfilled.

Because there is a risk within a fortress it seems that the earliest method of attacking them was siege. But this was not intended to enter in to this fortress, and its primary purpose was block the supplies for the fortress and secondly attack them by using traditional weapons (Newark, 2009). Siege tower was the method that used to enter through the walls of the fortress, which was a large and heavy mobile wooden tower drawn by soldiers (Campbell, 2005). The siege craft of ancient Chinese soldiers can be presented as an eastern method of the siege tower comprising many disadvantages since it was an open and vulnerable method (Jieming, 2006). Siege tower and siege craft are at figures 21 and 22.



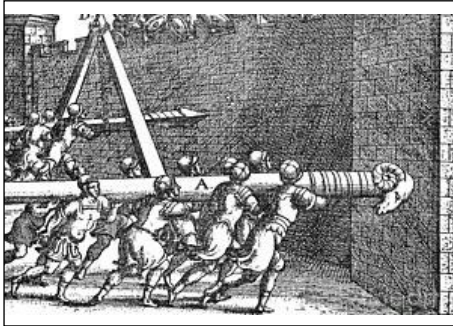
**Figure 21**  
**Siege tower' (Smith, 2012)**



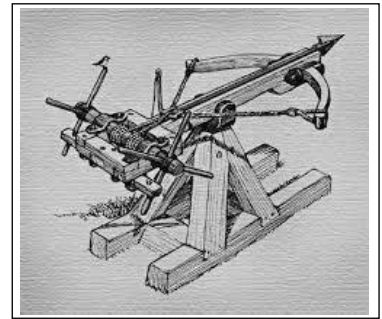
**Figure 22**  
**Chinese siege craft. (Siege craft, n.d)**

Due to the difficulty of using the above-described equipment against an active army there was a real requirement of creative findings. The Battering Ram was one of the machines that has been created to fulfill this purpose (Newark, 2009). This device seems to have been able to destroy strong walls and huge gates of the fortress and it was later equipped with a protective cover for the safety of its soldiers.

In addition, the other method that used to reach to the fortress was the attack over the walls. One of the weapons which has been used to throw large arrows was Ballista, a large bow shaped wooden weapon (Gurstelle, 2004). The weapon produced by minimizing



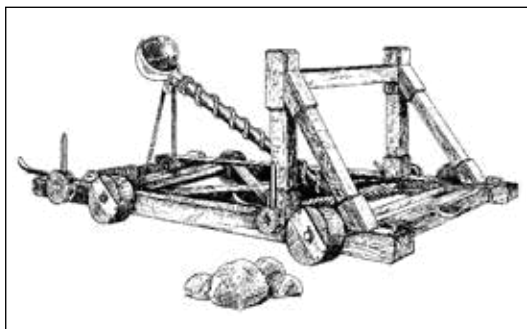
**Figure 24**  
**Battering Ram (Newark, 2009)**



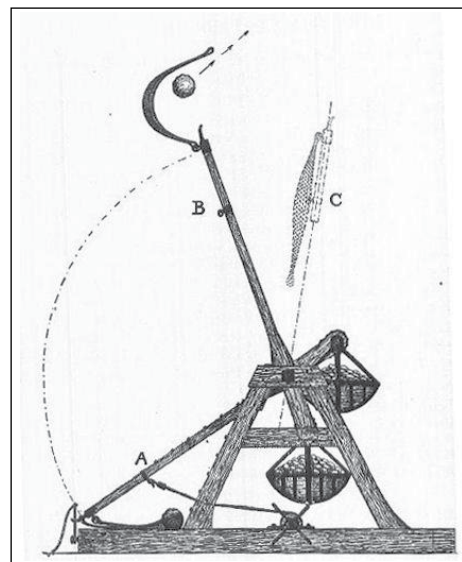
**Figure 25**  
**Ballista (Ballista, n.d)**

the weaknesses of Ballista was Catapult, a large stone throwing weapon designed by the famous artist Leonardo da Vinci (Whitehorn, 1946). It is clear that the benefit of the Catapult was the ability to damage the walls of the fortress and the army that was inside the fortress. Trebuchet was the later developed weapon which based on the Catapults and it is considered as the most powerful weapon before discovery of the gunpowder (Chevedden, Eigenbrod & Foley, 1995). Above discussed weapons are displayed in figure 24, 25, 26 and 27.

According to the sixth stage of this analysis, man has produced few equipment to surpass the existed battle advantage of fortifications. It is also evident that the battle advantage could be obtained through challenging the parallel thinking pattern.



**Figure 26**  
**Catapult (Wilkins, 2003)**



**Figure 27**  
**Trebuchet (Newark, 2009)**

## **Conclusion**

The time period of this study was from ancient time until the discovery of gunpowder and the deployment of fire arms in the battle field. Tactics discovered by humans for the war during this period can be analyzed under six stages. In all these stages, the parallel thinking pattern has been challenged to revoke the existed battle advantage. Six stages and the battle advantage of that each stages can be listed as follows:

- Stage 01 - Physical strength and the manpower of battle parties defeated the enemy.
- Stage 02 - Physical strength and manpower were challenged by primary weapons and battle parties were able to attack to enemy while maintaining a gap.
- Stage 03 - Sharpness of weapons was able to destroy the enemy while maintaining a gap.
- Stage 04 - Speed could challenge to the sharpness and the gap.
- Stage 05 - Body coverings (Body armour) and area coverings (Fortress) have eliminated the existed battle advantage.
- Stage 06 - Developed battle equipment to surpass the security of the fortress.

The purpose of this analysis was to conceptualize the behaviour of human thinking in the military history. Since evolution of the mankind was not a linear process, the above analyzed stages may vary according to the pattern of human development in each civilization.

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