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THE LAW ABOUT THE FIREPOWER OF THE ARMY

Abstract. A definition and formula for calculating the firepower of an army is given, and a scheme for calculating the firepower of an army is described with the numerical example. The law was drawn up for the victory of the army with more firepower. The limits of application of the law on the victory of an army with greater firepower have been determined.

Keywords: *army, war, armament, artillery, small arms, military aviation, military conflict, military potential*

Basic Concepts

Definition. The firepower of an army is a numerical characteristic showing striking ability of a given army per unit of time.

OMA - firepower of the army (rus)

AFP – army firepower (eng)

Dimension: $[AFP] = \frac{\text{million}_{-}\text{soldiers}}{\text{year}}$ or $[AFP] = \frac{\text{thousand}_{-}\text{soldiers}}{\text{month}}$ or $[OMA] = \frac{\text{soldiers}}{\text{day}}$

Dimension in English: $[AFP] = \frac{\text{million}_{-}\text{soldiers}}{\text{year}}$ or $[AFP] = \frac{\text{thousand}_{-}\text{soldiers}}{\text{month}}$

or $[AFP] = \frac{\text{soldiers}}{\text{day}}$

The firepower of an army can be theoretical, that is, calculated for a non-combatant army, as well as real, that is, calculated for an army conducting combat operations at the time of calculations.

An army's firepower is calculated for all enemy soldiers hit, including wounded ones.

To calculate the firepower of an army, it does not matter how many tons of ammunition were thrown towards the enemy, but what is important is the lethality of this ammunition.

The army's striking ability does not take into account:

1. Level of destruction.
2. Death and injury of civilians.

3. Death of soldiers and civilians as a result of hunger, frostbite, disease, and so on.

Calculation of army firepower

The figures in the calculation below are conditional, taken as an example.

Let it take, on average, either 1000 bullets (automatic, rifle, machine gun), or 10 shells (conventional calibers, artillery and tank), or 1 kamikaze drone, or 0,1 bombs (typical mass dropped from an airplane) to defeat one enemy soldier.

Every day, on a typical day of combat, the army in question fires 1,5 million bullets, 10000 shells, uses 500 kamikaze drones and drops 200 bombs.

$$\text{AFP (day)} = 1500000/1000 + 10000/10 + 500/1 + 200/0,1 =$$

$$= 1500 + 1000 + 500 + 2000 = 5000 \frac{\text{soldiers}}{\text{day}}$$

$$\text{AFP (month)} = \text{AFP (day)} * 30 = 5000 * 30 =$$

$$\begin{aligned} & \text{thousand} \\ & = 150000 \frac{\text{soldiers}}{\text{month}} = 150 \frac{\text{soldiers}}{\text{month}} \end{aligned}$$

Using the AFP value, you can calculate the most effective types of weapons in a given conflict:

$$\text{Small arms: } 1500/5000 * 100\% = 30\%$$

$$\text{Artillery: } 1000/5000 * 100\% = 20\%$$

$$\text{Kamikaze drones: } 500/5000 * 100\% = 10\%$$

$$\text{Air bombs: } 2000/5000 * 100\% = 40\%$$

As can be seen, the most significant contribution to AFP is made by aerial bombs.

Remark 1. The firepower of an army is not a constant value: it depends on weather conditions, increases during active combat operations and decreases during pauses. In addition, the firepower of an army may decrease due to a shortage of ammunition, a reduction in the number of military equipment, a decrease in the number of soldiers in the ranks, the withdrawal of allies from the war, and so on; Also, the firepower of an army can increase with increasing volumes of ammunition produced, from additional mobilization, from an increase in the amount of military equipment at the front, from the entry of new allies into the war, and so on.

Remark 2. At its core, the daily firepower of an army is an exact value, while the monthly and annual firepower of an army are averaged values over time.

Formulation of the law on victory and defeat of an army with more firepower

Law to win an army with more firepower

An army with more firepower will win if it can inflict an unacceptable level of casualties on the enemy before incurring unacceptable casualties itself.

Corollary № 1. About losing an army with more firepower

An army with more firepower will lose if it suffers an unacceptable level of casualties before an army with less firepower approaches its unacceptable level of casualties.

Corollary № 2. About winning an army with less firepower

An army with less firepower will win if it inflicts an unacceptable level of casualties on the enemy before it approaches the unacceptable level of casualties itself.

Example № 1. US Loss in the Vietnam War, 1965-1973: According corollary to the Loss to Army with Greater Firepower Inquiry, the US lost in Vietnam because its army's firepower was insufficient to inflict unacceptable damage on the enemy, and the damage suffered by the US Army itself was unacceptable. ; on the other hand, according to the corollary of winning an army with less firepower, Vietnam defeated the United States in the Vietnam War because it was able to inflict an unacceptable level of casualties on the enemy, while Vietnam's own casualty level was still acceptable at that time.

In general, the defeat of the powerful US military in Vietnam serves as a clear illustration of the following fact: a people fighting for their homeland can field a maximum of 8-15% (sometimes up to 20-25%) of the pre-war population, while the invader, most likely, no more than 0,5-1% of its pre-war strength will be deployed into the army [1]; resulting in the defenders having a potential superiority in army numbers that is difficult for the aggressor to overcome with the army's firepower. It is with this factor that the complexity of any conquest and numerous failures, known from history, in the conquest of other countries and peoples are connected.

Limits of application of the Army Firepower Law

Before the advent of mass armies in the 19th century, armed with firearms, the outcome of the entire war was usually decided in one main battle, or less often, there were 2-3 such battles. This most important battle of the war usually took place within one day, that is, one day decided the fate of a campaign, and often a state, so the attention of all military strategists was riveted on this most important day: how the weaker could not lose or even win - and How can the stronger one fully realize his advantage?

Sun Tzu's ancient treatise "The Art of War" is dedicated to the preparation for a one-day decisive battle and general recommendations for conducting combat operations on the day of the main battle.

In the 19th-20th centuries (with the exception of 1940-1941, when the Third Reich successfully used the blitzkrieg strategy), all wars were of attrition, that is, the total type of war prevailed with general mobilization and a complete restructuring of the state's economy for war.

There have been many battles in history without firearms - in them, as an analogue of firepower, you can take the number of enemy defeats using swords, arrows, spears and other edged weapons; but, since these were one-day battles, the law of the victory of an army with greater firepower does not fully apply to them, although in many cases the side that was able to inflict more defeats on the enemy either won or lost without defeat.

For conflicts in which everything is decided in one, often one-day, battle, the law of victory for an army with greater firepower does not apply, but for wars of attrition this law does apply.

Examples № 2, 3, 4 and 5. The law of the army with more firepower winning did not apply at the Battle of Gaugamela in 331 BC. e., at the Battle of Cannae in 216 BC. e., in the Battle of Molodin in 1572, as well as in the Battle of Cajamarca in 1532, since all four battles were one-day battles.

Example № 6. Law to win an army with more firepower was in effect in the 1941–1945 American-Japanese War: Japan's initial victories at Pearl Harbor and elsewhere were leveled by overall U.S. superiority in firepower, resulting in Japan's loss.

Example № 7. The law on the victory of an army with greater firepower was in force in the Russo-Japanese War of 1904-1905 - the Japanese had an army of greater size and, accordingly, with greater firepower than the Russian Empire in the theater of operations in question, so Japan naturally won.

Conclusions:

1. A definition and formula for calculating the firepower of an army is given.
2. A scheme for calculating the firepower of an army is described with a numerical example.
3. A law was drawn up for the victory of an army with more firepower.
4. The limits of application of the law on the victory of an army with greater firepower are determined and historical examples are given to illustrate these limits.

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