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part. Meanwhile, the basic tank should remain the decisive arm but its development should be relieved from the goal of universality, i.e., the tank should be designed and retained for its proper, central role while being integrated on the battlefield with other specialized weapons and support systems.

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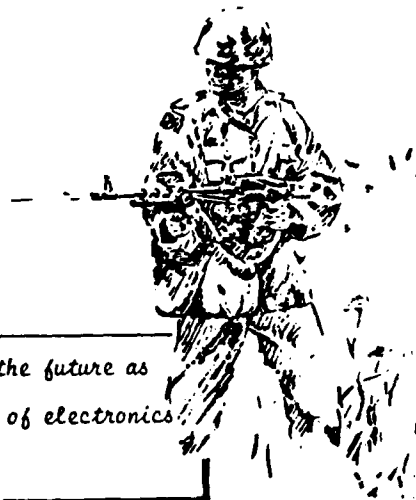
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"THOUGHTS ON THE FUTURE GROUND BATTLEFIELD AND THE MODERN WEAPONS SYSTEMS"

RESEARCH WORK

BY EG YAIR NAFSHI



Is it that human importance will be limited in the future as a prime battlefield factor - and the importance of electronics as a prime factor will be incomparable?

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FOREWORD

In the Summer of 1982, General Glenn K. Otis, at that time the commanding general of the Army's Training and Doctrine Command, explained to the Armor Conference at Ft. Knox, that "for the first time, our army has decided that we would look down-stream two decades. . ." he added, "if we stand still and do not reach out and challenge the mind, 20 years from now we will find ourselves with weapon systems designed to fight on the battlefield of the 1980's. . . and that is not where we ought to be."

I am an enthusiastic supporter of the idea. However, I know the context of the fortunes regarding intelligence projections of the Soviet and Soviet-supplied forces, and of the approaching style of operations that army planners envision for the future fight.

On the other hand, I know also the dimension of time required for developing a new modern weapons system. I know the budgetary problems, the size of the total army forces, the sequence of equipping priorities, and thus, the total number of systems that could be obtained. This raises the unavoidable question - Is it enough? Or, is it too little and too late? In other words, are we correctly reading the "map"? Are we preparing ourselves in the best way possible? I do not want to justify or to examine the contribution of one weapon or another, since a long time ago, the army seemed

Unforeseen technological advances by potential opponents or even close allies almost always require a response - a counter, at least, if not replication.

destined to become much more oriented on systems¹ which compliment each other in their relative contribution to the battlefield. I will limit myself to the ground component in the "joint battle" and will try to examine it as one system. I will try to make a future projection from historical lessons and predicting future needs in the modern war.

In my work I will try to provide one in a thousand flickering searchlights to those who devotedly make development and equipment budget planning policy. There is a high price for whatever the decision will be, however, there is no way to avoid bearing the cost the moment the decision is made. Probably, in the long range, that will be the lowest price in preventing war and the saving of lives.

If costs and the attendant budgetary and political problems had to be taken into account now, it is likely that none of the new systems would ever be built.

¹ As has always been the case in the Navy and Air Force.

PREFACE

There are faces to the East-West confrontation. Part of them, like an iceberg, reveal a little and conceal twice as much, until war comes and openly exposes them.

Three things have influence on Soviet doctrine: the abundance of manpower in the Soviet Union and the Communist bloc countries; a period of thirty years without war; and the assumption that Europe will be the military arena.

Since World War II (with the exception of Afghanistan), the Soviets have no direct lessons--only second-hand lessons derived from countries (Korea, North Vietnam and the Arab states) that use Soviet weapon systems. This process (one way or another), impacts on the consolidation of doctrine. On the other hand, in the Western countries, lessons are learned frequently, directly, fresh and new.

The development of new weapon systems is based on:

- * Military doctrine
- * Technology which enables better achievements
- * Operational needs based on battle experience and war lessons.

It seems that on the tactical-level, the Soviets focussed on the first approach, while Western weapon systems burgeoning growth responded to the latter two.

It has already been fairly said that no war will ever equal the previous one. "New" wars always start based on the output achievement level reached by the armed forces between wars during "Peacetime" in military thinking and application of war (the last war) lessons.

These additional "Joint operation" developments are made by military people, scientists and engineers. This is the only way to assure that lesson applications will bear fruit in the form of: new systems for conducting war, required appropriate equipment, fighting unit frame organization, and most important - well-trained men who use and operate the equipment with the success most hoped for in war.

From a historical perspective, we can see now very clear movement from war based on the proficiency of the single soldier (and his commander), to war based on mass and massive firepower weapon systems, with long, long "tail" services.

The source of all the generals and admirals deficiencies, as Liddell Hart cited in one of his moments of agitation, is that scientific development undermines all principles upon which they based their way of fighting. He referred to the strong struggle in the British Army in 1935 against the tank and aircraft development programs, their mutual interaction, as well as the assumption of combined operation by the two as the key for any expected success in the future.

After a short period of time, during World War II, the tank and the aircraft became dominant weapons on the battlefield. It is the combined operation between the two which molded the character of the Blitzkrieg campaign of the war, and when it came to an end, gave a new shape to armies

all over the world.

It is now almost 40 years after World War II ended. Tanks and aircraft still exclusively rule the world - but the same "science development" gospel from which they originated now threatens to take them down from greatness.

The breakthrough technologies of the early sixties and seventies paved the way for limitless electronic diminution, various types of computers, electro-optics, laser systems, etc. All these and many discoveries afford opportunities for developing new varieties of air and warfare equipment. We see the coinage of impressive new words in the military dictionary - terms such as "fire and forget" weapons, "stand off" weapons, "sensors," "target acquisition," "signature," "real-time," "C3I" (command, control, communications and intelligence), and many others.

Is this all bringing a real revolution and far-reaching change in the known battlefield? Do we have to be prepared for a new battlefield in which it is not possible to take a position without being a "target," to move and change position without somebody "firing" on us and "forgetting" while he sits in a crowded "C3I" accessory wagon pressing a button that releases a "stand-off" missile? Is it that human importance will be limited in the future as a prime battlefield factor - and the importance of electronics as a prime factor be incomparable?

The well known tanks - the keystone of any army: Are they going to disappear? Or, perhaps they will be modified to meet the demands of the future battlefield.



WHY A CONVENTIONAL WAR

The impact of nuclear weapons on strategic war is now widely recognized. Military forces can now deliver - at intercontinental distances with one vehicle - explosive power greater than that delivered by a 1000-plane raid in World War II. In nuclear tactical warfare, the problems of escalation and damage to the civilian population are analogous, to day, to the problems of strategic use.

Moreover, there has been Soviet achievement of substantial predominance in theater nuclear forces, and continued and, in some respects, enhanced Soviet superiority in conventional forces. In these circumstances, in the event of successful Soviet conventional advance into Western Europe, how credible would be the threat of a nuclear response?² In the face of Soviet superiority at that level, why would NATO resort to theater nuclear weapons, with all the destruction to both sides that would entail?³ Even more significantly, why would the United States use or even threaten to use its strategic nuclear forces, if that would ensure massive Soviet retaliation against North America? "If it is true that a nation will not commit suicide for another, neither can it commit suicide to assure its own survival. Suicidal threats are in general not a reliable means of dissuasion."⁴ The conclusion almost universally drawn from this perceived deteriorating

² It has been obvious since the 1950s that the West needs to rely less on threats of nuclear destruction and much more on improving conventional defense.

³ Current NATO strategy has little support among the Western public.

⁴ Albert Wohlstetter, "Bishops, Statesmen, and Other Strategists on the Bombing of Innocents," Commentary, June 1983, p. 30.

credibility of the nuclear deterrent to Soviet conventional attack in Western Europe is the need to strengthen NATO conventional forces.

At any rate, as in all previous wars, the conventional war will consist of a highly violent collision between all the ground forces in combat. Concerning the warfare objectives, these will remain - the destruction of: armed forces, combat means, weapons, military logistic layout storage, military and civil subsoil installations, infirmity of enemy forces and proficiency achievement on vital areas⁵ - in essence - as a key for any success.



Mongol Cavalier - the prophesy of definite mobility on the battlefield.

⁵ As Liddell Hart well conceived and defined; "The aim of the new tactics must be to paralyze the enemy's action. The slogan of "destroying him" in battle leads to self-exposure, self-pinning, and the risk of being smashed. Dominating areas is going to count more than capturing or maintaining positions. We want a new principle of offensive fluidity of force - to operate like the sea or like a swarm of hornets, not like a battering ram...." The Indirect Approach, London, latest ed. 1954, p. 183.

NEW TECHNOLOGY AND THE BATTLEFIELD

"The goddess of victory," wrote Douhet⁶ "smiled at those who see the changes in the character of war and not at those who tried to adapt to them after they had befallen...." Truly, we all speak for the necessity of readiness for the next war, however, in fact, almost all the wars in history began with weapons of the previous war. Despite the fact that surprises caused by the development of a new tactical consciousness still occur, it has rarely happened in the past with new substantial weapons brought into service before the war. But in those cases where it did, it generally caused a "minor revolution" which ended in most cases with the collapse of the surprised side.

Although the effect of some of these developments was immediate and drastic, the impact of others on the nature of warfare was more gradual, taking place over decades or even centuries, the old and the new existing side by side until the new entirely replaced the old.

World War II was a period of sudden change in the military arts and sciences, and we have since been in the midst of another. The most recent and ongoing period is somewhat enigmatic, because the new capabilities have been demonstrated only on a relatively small scale in wars peripheral to the main streams of history and without decisive effect. Yet the capabilities have become known from these modest demonstrations⁷ and from field tests. They

⁶ Giulio Douhet, the Italian general. Famous in the field of aeronautical thought. He was the originator of the "strategic bombing" idea.

⁷ Only a war in the Middle East can serve as a partial model for a high-intensity conventional conflict, where both concentrated battlefield and strategic assets are, respectively, either employed or threatened, in a very short space of time.

are represented in the holdings of all major and many minor military powers.

Modern weapon systems always have been associated with new technology, and the latter changes today frequently. As the result, the rate of change in the character of weapon systems between one war and another, increases also and new modernized systems came forth from time to time. In spite of the relatively short time between wars, the situation can possibly be created where war could be instigated embracing the use of weapons that were barely comprehended in previous wars. As a result, a technology surprise at a critical point may cause a crushing military defeat. Fitting together a broad variety of anti-aircraft defense missile (SAM) systems, in addition to anti-tank weapons which are less efficient but in large quantity, is only one partial sample of what is liable to happen to one's side if one buries his head deep in the sand.⁸

The problem, of course, is truly to guess the conditions of the next war. Considering the political constellations and the burgeoning projections of weapon systems, actual acquisition and forestructure are hard to prophesize, since the inconsistent character of human beings and of nations must be taken into account. However, it influences both sides to the extent that it concerns the concrete capability of actual fighting based on technological achievement, and these attainments can be reasonably observed. It can be estimated that what is found on the drawing board today or in experimental processing will come into reality sooner or later. Therefore, it is necessary to consider all the existing developments.

Certainly, this approach could lead to exaggerated pessimism with all

⁸ The Arab Israeli War - October 1973

the flowing result, but these two - the technological forecast regarding what will become and the availability of these developments in our or the enemy's resources - must lead us in every evaluation of the next battlefield.

Excluding the Indo-China borders, the ground surface condition in all the primary potential arenas; (Europe, the Russian-Chinese border, and also the India-Pakistan borders and all the Middle-East) make it possible, if not necessary, to operate armed-motorized forces in quantity. Therefore, all the modern armies are founded on armored fighting vehicles (or armored vehicles) and common-land warfare doctrine identical with "armored warfare."

Territorial defense elements (wherever they are) and special forces (including all kinds of airborne forces), are considered as secondarily valuable in all composed armies build for "real" war. Therefore their portion in the total order of battle is small and marginal⁹ - all the biggest ground force armies in the world are built and organized for combat in armored formations and are intended to achieve tactical and operational success by armored warfare.¹⁰

⁹ Airborne troops, are not aproved by any army as the "main" force in combat. They are recognized by all as qualified troops for carrying the main effort only in "unsophisticated" environments, or, "semi-sophisticated" in essence. This means only in secondary battlefields, in which they will not stand against the main enemy "armored" force.

¹⁰ The terms "mechanized" or "armored" should not be misleading. To sum up, there is no essential differentiation in meaning between the two. They depict more about the organizational frame of reference than on the actual structure of forces.

From the viewpoint of forces activated or of command and control, the modern conventional battlefield still is similar to that of the Second World War. In the European arena, the potential "aggressor" - the Russian party has prepared and constructed forces to execute "super blitz" - an extensive improved version of the German Blitzkrieg in 1939-1940, while the potential "defender" party, NATO, has prepared himself to prevent war and to defend on the model of the "Wehrmacht" in supreme defensive action between 1943-1945 in the Eastern front and in North-West Europe.

In essence - the significance of changes, is reducible to new developments in the lower techno-tactic level--namely, the appearance of new measures and improvements effected over the other previously approved measures.

The general direction of all these developments is clear. Most of them on the one hand were directed toward completing the "armoring" process, and with diligence succeeded in adjusting the AFV to new requirements (or to the adoption of technological possibilities), and on the other hand - as a result, improvement of all kinds of anti-armor capabilities and resources. This counter effort to stop, destroy and defeat armored forces, gives expression - as expected, essentially in the field of fire power.

To the unavoidable question, whether or not we expected revolution, I return a restrictive answer: true, all the battlefield elements are well known. Yes, first of all because the new technology apparently opened new horizons for planning and leading advanced military operations, and because the brand-new military technology products will be available. Restrictive, first of all because of the appallingly expensive price per unit - and of

course cost in this widest sense is a trivial restriction, that may stretch the drawing process over many years. Secondly - means never can set themselves in motion, there must always be a man behind the means. The problem now is - in a generation of fighters and servicemen - to be able to use them with flexibility, intelligence and open-minded thought without enslaving ourselves to them. However, human nature is unpredictable.

Of all the viable technological breakthroughs, the area munition adds to ground warfare a tactical dimension previously unrecognized - the ability to block an area quickly in a controlled manner, in the depth of the enemy's tactical rear area, in the fighting zone, and within the area under our control.

In this capacity it is possible to "freeze" the battlefield (without the need for nuclear means), to the point of neutralizing the ability of motorized units to conduct a functional armored warfare, and maybe to the point of neutralizing the movement ability of even a single armored vehicle.

The important quality of area munition is that the blocking of the exposed land makes the relative strength meaningless. When a given area is efficiently blocked, it is blocked to the passage of an army in the same way as it is to that of a company. The area munition as presently used is operated as an element of delay and obstruction. The defeat of armored formations, on the other hand, will take place only on the battlefield.

For this reason, the development of PGM's becomes an important element - more so than the area munition, although the PGM does not present a new dimension in ground warfare.

Eventually - it seems to me that the principle of C³ is the most

outstanding innovation. Since the origination of warfare, friction was the element which has prevented men from reading the battle correctly. However, the new systems and means - the RPV's, RADAR and all other processing centers, at least seemingly make it possible to read every phase of the battle more correctly--and to read the battle is a key for any victory.



TOP RIGHT: Representative of the third unarmored period: British Dragoon from the Crimean War in 1854.



TOP LEFT AND BELOW: Two weapon-systems which changed the battlefield face: The English long-bow, the musket rifle.

ON THE DOMINANT WEAPON SYSTEMS

The Franco-Prussian War in 1870 featured one of the most dramatic cavalier assaults of all periods when the cavalier brigade commanded by Von Bredow assaulted the French artillery position and prevented the German advance, albeit with numerous casualties. More than half the brigade lost their lives in one assault, but the cannons were silenced. During the next few decades, the traditional supporters of the admirable cavaliers used this assault to give due credence to their controversial argument that horsemen riding in combat had the task of prime importance.

History viewed it differently. A decade before, during the American Civil War, influence on the battlefield by the mutually destructive rifle and bullet fire power, was clearly evident. The fire power and the artillery were then already known as combat means on the battlefield. When the Von Bredow cavaliers assaulted with drawn sword in hand they knew exactly what risk and prospects they were facing. However, jointly and severally - with swords and their horses, they pridefully went forth; with their glory, their social and professional status and all the faith and confidence in long years of military thought, the same as tried and tested operational doctrine.

Someone compared their assault to "riding almost toward death." Since then it became immediately associated with

WEAPONS AND TACTICS
FROM THE HISTORICAL
POINT OF VIEW¹¹

Most of our weapons are more nearly perfect, taken as "things in themselves", than are those of our enemies. The difficulty lies in the systems and methods of their use in battle, in tactics, and in the design of weapons particularly suitable for use in the tactics now profitable.

Mobility, hitting-power, protection - these are, and always have been, some of the keys to victory. Where other things - surprise, or concentration at the decisive place and time, or skillful maneuver - have won battles, these things have usually derived from superiority in mobility,

full majestic splendor, but absurd from the military point of view in lieu of effective weapon systems.

Fire superiority in the battlefield was now completely clear, and yet, by the year 1908, the British Army was still immersed in discussion as to what kind of sword their need demanded - should it be barbed, with sharpness on the edge, or perhaps a sharply bladed sword. Subsequently, in the same year, the British horsemen were equipped with "the most beautiful barbed sword ever to be invented."

In 1936 the British Army had more than enough information on German intentions to build 30 new divisions, about half of them armored and mobile. The British headquarters conducted an urgent overall course of action debate - how to offset the dangers.

It was already 60 years since the Von Bredow cavalier assault and almost two decades since the First World War ended, since the appearance of the first tanks in combat clearly demonstrated their potential and superiority over a cavalry unit and completely neutralized the saturated, obstructed battlefield and the atmosphere of hellish gunfire.

And here, the British army reached some important decisions, two of them in particular. The first - to triple the cavalry corps budget, and since there are great dangers of suffering many horse losses, to equip the officers' cadre

hitting-power and protection, or from superiority in one or two of these qualities.

It would be foolish to ask which is the more important of these three qualities. There have been phases of war in which one was all-important, and the other two did not matter to a great extent, but usually these three qualities have been interlinked.

There has not been a plain and simple progress from marching to riding. Hitting-power and protection have complicated this; there have been successive "cavalry periods", in each of which cavalry has played a rather different part in the game. There have been other periods when, for reasons connected with hitting-power and protec-

with two horses, in order to keep them fighting on the second after the first was destroyed.

The second decision was to double the tank corps budget--but not more than double. Moreover, considering the frighteningly close German danger; also, to equip every British officer with a horse to permit him to keep "fighting" with his unit after his tank stopped, became stuck or was destroyed!

Looking upon the needs and background of the future battlefield; the facts of history show a lack of practical ability on the part of commanders to discern the critical and historic moment when one weapon system loses its dominant position in combat. This obliges us to answer the query - whether or not in the end, all the new means and weapons we develop now to meet the needs of the Army of the 90's will not be revealed useless, as with the horse, when his luck ran out.

"The dominant weapon is not necessarily the more powerful, the more accurate, the more blow-dealing, or the more portable; it is the weapon which, on account of its superior range, can be brought into action first, and under the protective cover of which all other weapons, according to their respective powers and limitations, can be brought into play...."

J.F.C. Fuller

tion, cavalry has mattered very little.

A guiding thread to the study of all the history of war, ought to show us a pattern that links mobility and protection; as well as fire-power, into a comprehensible shape for the various periods of war.

I believe we find it more easily when we start with protection, and link this quality with the other two.

A primary connection between mobility and protection comes into the pattern. Two thousand years ago it was an armored force of footmen that bestrode the world; a thousand years ago it was an armored force of horsemen;

ON THE NEXT WEAPON SYSTEMS

It is possible to examine the Army's approach to its weapons systems, as one measure of its overall quality, and in view of the Army's responses to newly discovered difficulties and/or dangers that manifest themselves on the battlefield. There are two principal approaches: the first being the "mission oriented," or specific approach. This entails determining the most efficient weapons system and attaining it in quantities relative to the dimension of the new situation. The second approach is that of "economic" - versatility. This entails searching for methods with which to modify, and make use of, the existing systems, having adapted them to a level of capability to overcome the newly discovered problem.

For years, we have been implementing the "economic" approach, at times out of principle; at other times due to a lack of options. Thus, despite our principles, we are self-propelled into the vicious circle which can be designated the "versatility syndrome."

In essence, what has occurred, is that we have had, in our possession, basic weapon systems which are very costly, and we have been modifying them, in order to adapt them to increasingly new needs. All this, so as to be "economical." Due to the fact that the purposes of the

*today the world reels before
an armored force of vehicles.*

*Let us attempt a division
of the history of war into
the periods that are indicated
by these armored wave-crests.*

1. First unarmored period -
pre history to 479 B.C.

*In that period men knew
little of metal-working, and
few men had armor. This
period ends with the Battle
of Plataea, when the Greek
armies cleared the Persians
out of Europe.*

2. First armored period -
479 B.C. to 378 A.D.

*The armored foot-soldier
mattered most in warfare,*

weapons systems, are constantly increasing, we remain with a shortage. To compensate for this shortage, we procure more and more of the same basic expensive systems. When yet another problem is discovered, we find ourselves with another shortage, that of the necessary budget and means with which to purchase and develop the specific answer to the new problem. Once again, due to no other option, we exert all our energy into adapting our existing systems, to the necessary level to overcome the newly discovered problem. The number of uses increases, a shortage is created, and so on. This process is typified by a consistent shifting and diverting away from the original purpose of this equipment and coupled to a "cavity-filling" process, in which the possibilities for adaptability of the systems, becomes minimal if not, at times, nil, in the near future.

The clear direction, in the world today, is that of specialization, proficiency and professionalism. To adhere to "versatility," is at the very least, strange.

Routine and the lack of clear thought processes lead us to the route of augmenting the quantity of our present weapons systems, which is both costly and contains a measure of real danger since our needs are serious. Adapting our present systems to fulfill new purposes will lead us away from employing specialized systems, even though the latter

until the Roman legion was destroyed at the Battle of Adrianople in 378 A.D.



Representative of the first armored period: Roman Legionnaire from the time of Augustus.

3. Second unarmored period -
378 to 774

Cavalry then became the main arm that won battles; it was usually a fairly light

are at a higher level of efficiency and are at times less costly. Therefore the following question surfaces. Do we continue to occupy the battlefield with universal weapons systems, (i.e., adding more and more tanks) or should we purchase mission oriented systems, while depending on the current tank as a basis but altering the proportion of the other components of power?

Those avidly supporting universality, who are assaulting the "mission-oriented" system concept, are doing so on their overall effectiveness in battle, not on the basis of these systems' effectiveness in performing their designated tasks. Their claim is that even when a mission oriented system is very effective in the performance of its specific duty, -it is deployed on the battlefield, against only a small portion of the targets and thus its use is limited to specific missions, leaving it unused for a certain timespan - hence, it is ineffective. This view of a battlefield as an organized network, in which everything occurs in an organized and respective fashion (i.e., step by step - first the approach march, followed by the fixing contact, then fighting to the objective, then assault, and fighting on the objective, etc.) hardly fits a unit greater than the company. On the future battlefield, the nature of the fighting force will be so encompassing and large, that it will undoubtedly see a range of clashes, in which all

*cavalry, not fully armored.
It fought by missiles more than
by shock at close quarters.*

4. Second armored period -
774 to 1346

*The armor was coming back
again, first, with Charlemagne's
victory at Pavia in 774. From
this time forward the heavy
armored knight dominated the
battlefield. But in the slow-
changing Dark Ages and Middle
Ages the value of the archer
as an auxiliary arm gradually
increased, until the Plantagen-
ets found in the Welsh longbow
an auxiliary to armor that
could master armor. The end of
this period came with the Battle
of Crecy in 1346.*

phases and sub-phases of the fighting, will happen at the same time.

The wide extent and large number of weapon systems in the future battlefield, will afford full and effective deployment of "mission-oriented" systems all along the battle, while performing their task at all times in a higher or at least equal efficiency than that of the tanks, and for the most part at a much lower cost. Concurrently, the same tank units will be freed to function within their aim and to use their full capabilities to face necessary dangers related to their original purpose, and not against objectives that can be dealt with more efficiently and less expensively, with more specialized systems. We will arrive at the correct answer to the question, if we know how to build the fighting components in a way which would achieve a successful balance between the ability of specific mission oriented systems to support and complete their function and perform slices of missions, and between their quantity within the overall force.

If we do not know how to intermerge a proper and complete number of mission-oriented systems within the tank forces (which are safe and known), if we divert the tanks themselves to perform missions that are not their own, we will "go down" in history as "those who added a second horse" to balance the danger.

5. The third unarmored period -
1346 to 1917

The period has many tendencies within it. It is the whole period of modern warfare up to the point when the tank becomes important. The development of modern industry produced an immense increase in fire-power. The end of this period came with the Battle of Cambrai in which the tank was first given its chance.

6. Third armored period -
1917 to ?

All the new machines and new forces that had been produced since World War II created a novel and unrecognized potential within a familiar pattern; but it has been less obvious how, taken together, they have rendered essentially

If we do not rely on mission-oriented systems to perform their function in a complete way, if we want to add "safety" to each of them and a collateral of tanks, we shall find ourselves in the same spot as those who decided on the horse beside the tank.

obsolete many aspects of the military practice. Those practices persist; and, because they remain effective when used in certain places, in certain

ways, and in profusion, they cannot be neglected although they must be modified to meet the realities of new weapons and sensors - seeking a way through the kaleidoscopic onset of technological challenges to the known organizations, doctrines, and ways of doing things.

Wintringham's book, which was written in the year 1942, was published in 1943. The query he set up, according to many military commentaries might be answered in the '73 date - namely, the Yom Kippur War, as heralding the end of the third armored period, and the beginning of the new unarmored period, the fourth in history. In that period - fire power and mobility will be accorded a more important task than protection.

HISTORY REPEATS ITSELF - IS IT SO?

¹¹ Summary from the book: Tom Wintringham and J.N. Blashford-Snell, Weapons and Tactics (orig.-Faber and Faber, London, 1943) 2nd edition, Perquin, London, 1973.

EPILOGUE

"War in its literal meaning," wrote Clausewitz,¹² "is fighting.... The necessity of fighting very soon led men to special inventions to turn the advantage in it in their own favor; in consequence of these the mode of fighting has undergone great alterations; but in whatever way it is conducted its conceptions remain unaltered, and fighting is that which constitutes war...."

It is the inventive genius of man which has obliterated his sense of moral values. From the javelin and the arrow to the heavy bomber and the missile - the very power to destroy, first slowly and then at terrific speed, has intoxicated man. From the first flint axe through to the sword, banded bow and rifle has at length emerged a frankenstein monster - the inventiveness of today - that is destroying man's own work, his own culture, his own civilization, his past, his present and his future. The machine, sprung from the intelligence of man, has through man's worship of it, turned man himself into a piece of machinery.

Truly it has been said that "We have got into a maze of machinery," and that in it "We have lost the vision of man's place in the universe."*

"War cannot be eliminated," wrote J.F.C. Fuller. "It is part and parcel of life; for life in its broadest meaning is the shifting outcome of destructive and constructive propensities...."* I do not believe that man's

¹² Carl Von Clausewitz. On War. Edited and translated by Michael Howard and Peter Paret. Published by Princeton University Press 1976. Book Two - On the Theory of the Art of War. P. 127.

inventiveness can be restricted, and as a consequence, all bans on weapon development will prove futile.

More than ever today, we are still far away from the last day vision. "They shall beat their sword into plowshares, and their spears into pruning hooks; nation shall not lift up sword against nation, neither shall they learn war any more...."¹³

"What I do believe is that war can be restricted, because history clearly shows that normally it has been."^{*}

The limitation of the horizon will be removed - the challenge is the enemy beyond!!



The new weapons systems will bring to an end the limitation of: Hidden darkness, obscurity created by dust and smoke. The mightiest weapons available will, with their level of precision and reliability, turn the battlefield into a succession of intensive collisions with quick, decisive and destructive results. More than ever it will be a "joint battlefield" in which every system contributes its relative share to the final result, but, more than ever, as in the past, at the core still stand the men - the soldier and his commander.

¹³ Isaiah 1. Chap. 2, para. 4.

^{*}Quoted from the introduction to Armament and History by Major General J.F.C. Fuller. A study of the influence of armament on history from the dawn of classical warfare to the Second World War. New York. Charles Scribner's Sons, 1945. P. XIV.

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