

War II, thousands were sold by the Director of Civilian Marksmanship to National Rifle Association members.

My first affair with the M1917 was entirely too brief. After a few months I was drafted out of the Maryland State Guard and into the Active Army, and I had to turn in my beloved Enfield before leaving for active duty. Since I had drilled with my M1917 each week and had fired both ball and blank ammunition in it on several occasions, parting with this rifle was difficult.

After entering the Active Army, I had many opportunities to use the M1 Carbine, the M3 "grease gun," and the

legendary M1 rifle. Today, as a member of the Maryland National Guard, I qualify each year with the M16A1 rifle. All are good weapons and certainly of a more modern design than the M1917. But I never see an Enfield without slipping back in memory to the state guard and night maneuvers on the upper Potomac near White's Ferry (of Civil War fame) or hearing the ghostly crackle of musketry and smelling smokeless powder as we blazed away with our Enfields on the Fort Meade rifle range.

Other more modern and efficient military weapons have replaced this

now elderly World War I weapon. As far as I know none are left in the Army's inventory except a few specimens in post museums. As with all first loves, however, I'll never forget the M1917. To me, the sleek, graceful rifle will always be alluring and elegant.



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Philosophy, Technology, and Tactics

CAPTAIN THOMAS P. KRATMAN

There seems to be a widely held belief in the U.S. Army today that "technology drives tactics and tactics drive technology" and that this has always been true. At its most extreme, this belief leads to an overly mechanistic, falsely scientific view of warfare in which the heaviest artillery is always seen as a sure winner. But history shows, I believe, that technology — instead of driving tactics — drives techniques and other technology. Indeed, any number of other factors may act singly or in combination to create or change tactics. A short explanation of tactical changes from pre-Biblical times to the recent past can demonstrate this point.

It is useful first, though, to define some of the key terms in this discussion. *Tactics* is the art (and sometimes science) of pitting strength against weakness. Much of what goes by the name of tactics in the U.S. Army (and others) should be called *techniques*

that support tactics. Thus, the way a machinegunner lays his gun along an FPL is a technique. But the way a platoon's weapons and fortifications are tied in to allow small arms to engage dismounted Infantry and separate it from armor (leaving the armor vulnerable to antitank weapons) is tactics. Similarly, camouflaging preparations for offensive action in one sector while drawing attention to another sector involves techniques if they are taken individually, but these things constitute tactics if they are taken together. Put more simply, techniques are a science and tactics an art.

Technology, as used here, refers to new technology, specifically to manufactured devices of recent invention. The difference is that centuries-old technological devices that have only recently found military application involve not science but wisdom, a new way of looking at things.

In the ancient world, swords,

spears, bows, arrows, slings, and suits of armor — all technological innovations in their times — were around for thousands of years without influencing tactics. The heroes of Homer's *Iliad*, armored like turtles in some cases, went forth to do battle without a thought for tactics. No different from neolithic village champions, these "high-tech" warriors of the past fought and either conquered or died singly.

Three successive ideas, however, were to have a decisive influence on warfare for some centuries. These were that men who were trained to march and fight in close order could form units of almost unbreakable density; that this would allow a frequent, organized relief-in-place of the rapidly fatigued front rank; and that men organized in such units and drawing physical and moral support from their fellows would willingly advance to close with and to physically and

morally overwhelm a foe who was not as well supported. These ideas formed the basis of the Greek phalanx, which included no new technology. Nevertheless, from Marathon to Utica, these ideas of discipline, order, and mass triumphed — often against a technologically equal or superior foe.

Technology did not drive the next significant tactical development either — the Theban (and later the Macedonian) phalanx. This phalanx employed the principle of mass, space, and time to group large forces at the point of decision while trading space and weaker forces for time until the main effort could be decisive.

Some might argue at this point that the 21-foot Macedonian *sarissa* was an example of tactics driving technology. It should be recalled, however, that this pike was at most a product improvement of existing technology and, more probably, only an adaptation of a long-existing technology to the new formation.

MORALE

Before continuing to history's next major tactical advance, the essentially morale-based nature of ancient battles is worth considering. Few such battles were won by flanking or enveloping maneuver (Thermopylae, Cannae, Cynoscephalae). They were won, rather, through the physical attrition of one side or the other (Zama), or through the breaking of morale and the subsequent mass desertion of one side (Mantineia, Metaurus, Arbela, Issus, Marathon).

This desertion was a curious phenomenon. It did not take place at the front of the formation, because to turn was to die. It did not begin with the middle ranks; the soldiers could see the battle and were in any case prevented from running by the physical presence of the rear flanks. This desertion began with the rear ranks; these soldiers — out of danger but nearing it; unable to see the enemy or gauge the progress of the battle; hearing only screaming and the clashing of arms; seeing their own wounded and dead

but seldom any enemy casualties — would be morally overwhelmed. First singly, and later en masse, they would quit the field of battle.

The other weakness of phalangeal tactics was that all the tactical and morale value of fighting in close order supported by comrades could quickly be lost if, because of rough terrain or enemy action, the cohesiveness of a formation was lost.

It was to combat these effects that the Roman Legion was evolved. The Legion, employing only old technology, and much of it inferior, revolutionized warfare with ideas. (Torso armor and the short sword, for example, taken individually, were inferior to plate armor, mail, and long swords, but they were cheaper.)

The more obvious of these ideas was to retain the phalangeal principles of order and discipline but to break the formation into smaller units. These smaller units would have gaps between them to allow the units to move independently around minor obstacles without breaking up the formation itself.

The second idea was to group men by physical fitness or individual fighting ability and age or morale. Thus, the youngest, least experienced, most physically fit — but most likely to break — troops were put up in the first rank companies. Behind these units, called *Hastati*, were the next youngest, next most likely to break units, called *Princeps*. In the last rank were the oldest, least physically fit, but most reliable men, the *Triarii*. In this way, the strongest troops in each category, combat power and morale, were at the greatest point of danger for that category. After this, few Roman armies were ever broken by the enemy and fewer still by the terrain.

The most profound advances in military technology during this period of Roman ascendancy — the use of torsion-type artillery and elephants — actually had little effect on tactics. Indeed, a study of the use of elephants during this time shows that for all their apparent potential, they were singularly ineffective.

Throughout the Middle Ages, the

few tactical changes that came about did so because of the rediscovery of earlier tactics in combination with various social and political factors, not because of technological changes. The heavily armored horseman, the feudal knight, arose to preeminence without the benefit of technological innovations in the wake of the social, economic, and military collapse of the Roman Empire. His mail coat, shield, and sword were nothing new. The selective breed of bigger and bigger horses that could carry more and more armor was by then a long-established technique.

MASS, ORDER, DISCIPLINE

And later, this knight and his tactics, such as they were, were not rendered obsolete by technology. What destroyed the feudal knight, literally and figuratively, was the rediscovery of the beneficial effects of mass, order, and discipline. This rediscovery came in the form of Swiss pikemen and German *landsknechts*, the Spanish *tercio*, and England's line of dismounted men-at-arms at Crecy. Moreover, this was done with the technology of 1200 B.C. and the philosophy of 400 B.C.

(I must confess that gunpowder made the feudal castle obsolete. But then, a castle whose usual occupants lay dead at Sempach, Agincourt, and similar places, was already somewhat obsolete.)

Looking at things objectively, an observer of the late Renaissance Period might have predicted that gunpowder would revolutionize the tactics of warfare. After all, it could hurl a missile that could kill at a range far beyond that of previous weapons. This observer would have been partially right — but mostly wrong. On the plus side, gunpowder did cause the art of fortifications to concentrate on lower, thicker walls to give protection. But that was engineering, not tactics. Gunpowder did make personal armor mainly obsolete. But that was the technology of ordnance, not tactics.

Gunpowder in muskets could kill

men at three to four times the range of a Roman legionnaire's *pilum*. Curiously, though, men continued to march in close order, as Roman legionnaires and Macedonian phalangites had, to fire on command, and to decide the issue physically and morally in close combat with the bayonet.

Napoleonic tactics were not driven by technology, for there were no significant technological advances in that era. Napoleonic tactics were driven by Napoleonic brains in combination with the great resources made available by a mass levy of troops.

MAJOR LEAP

At the time of the American Civil War, a major technological leap was made in the form of the conical bullet in the muzzle-loading rifle. Yet, if the casualty figures of that conflict tell us anything, it is that the bullet did not change tactics much. Without belaboring the point, let us say that tactics did change some, because this muzzle-loaded conical bullet enabled rifles to be reloaded quickly and, with the greater accuracy inherent in a rifle, this improvement gave a preponderance of combat power to the defense. In other words, it created an imbalance. The failure by commanders on both sides to recognize this imbalance contributed greatly to its effects.

On the other hand, an argument could be made that this technological advance was not nearly as significant to tactics as leadership and geography were. In the Franco-Prussian War of 1870-71, for example, using weapons even more defensively powerful than the muzzle loaders of the American Civil War, the campaigns were fairly mobile. The differences in this case were the superior leadership of German arms and the geography, which favored offensive action.

In World War I the earlier imbalance came to full fruition on the static western front. Machineguns, trenches, barbed wire, artillery, and better defensive (wire-and-trench-protected messengers) than offensive

communications (unprotected messengers) combined to produce a deadlock that could be broken only with radical changes in technology and techniques. The whole perception that technology produced the static western front is quite misleading; on the eastern front in that same war, using the very same technology, a mobile campaign was fought. Why? Demographics and geography. On the western front, there were simply so many men committed on each side on so small a front that there were no weak points to exploit on either side. (If two mad kings in the Middle Ages had committed their entire armed forces to fight for a three-foot-wide bridge over an unfordable river, the result would have been the same — without any advanced technology.) On the eastern front, the reverse was true.

World War II may seem to be a case of technology driving tactics and vice versa. Indeed it is true that the technological factors that contributed to a deadlock on the western front in World War I had driven the development of a new, highly technological weapon — the tank. But this was merely a case of technology driving technology.

The tank, used in small numbers to support the infantry armies before 1940, was in itself insignificant. Only when tanks were used in combination with the infantry infiltration tactics the Germans developed late in World War I did they affect tactics significantly in Europe. And this is a case of tactics affecting tactics. Moreover, even in Western Europe, North Africa, and the wide open spaces of the Soviet Union, factors of geography and demographics could completely alter the nature of the fight. This is what happened at such places as Stalingrad and El Alamein, in Italy, and on the Cherbourg Peninsula.

For example, on the Cherbourg Peninsula following the Normandy invasion, the combination of geography and number of troops committed to the front negated all the supposedly overwhelming offensive power of the tanks. This combination produced,

for the time it took to tear the German Army to shreds and produce weak points to be exploited, a situation reminiscent of World War I, the American Civil War, or that mythical three-foot-wide bridge.

During the Korean War, insufficient troop density on the part of the United Nations allowed the North Koreans to produce a fluid situation in the first few months, and this proves my point again. As soon as the U.N. had a front no longer than it could defend, the war bogged down for a while into a World War I style contest. Somewhat farther north and later in time (in the CCF intervention) this cycle was repeated.

It is not my intention to suggest here that technology never drives tactics or vice versa. Rather it is to show that technology is merely one factor among many and, historically, one that has not been the most significant.

Instead of saying that technology drives tactics and vice versa, we should say that technology normally drives technology and tactics normally drives tactics. We should recognize that in cases where technology has driven tactics, it has been as a result of an imbalance — either in granting overwhelming advantage to the offense or the defense, or to one party to a conflict.

Finally, we should also recognize that where technology has driven tactics, it has not done so in a vacuum. Factors such as leadership, geography, demography, and philosophy, among others, have had far more significant effects.

The implication of all this for the U.S. Army is that perhaps our enthusiasm for technology is misguided. A more balanced view, one in which technology is only one of a number of factors affecting combat, would enable us to do a better job of carrying out our mission.

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