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WARFARE IN THE LIGHT OF HISTORY

An Exploratory Essay for the Rushlight Society

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War is one of civilization's oldest activities--the second oldest profession say some. Although it has been much studied and analyzed by scholars and soldiers, probably no one has ever scrutinized war in the light of, well, light. By light, I mean, of course, the natural and artificial illumination which enables us to see. By war or warfare, I mean military affairs, to include not only wars and battles but also tactics, doctrine, equipment, organization, and other forms of military activity. The relationship between these two phenomena--light and warfare--awaits serious exploration. It is altogether fitting that the Rushlight Society explore this relationship.

First a few words to justify this intellectual undertaking. Some may say that the connection between light and warfare is self-evident, even simplistic, and they would consider such study to be superfluous, like studying the relationship of gravity to agriculture. Yet, if a gravity-oriented society existed, the study of gravity and agriculture would indeed be pertinent for that society. Therefore the Rushlight Society's existence alone justifies studying the relationship of light to anything, let alone an important subject such as warfare.

Furthermore, the relationship between light and warfare is not as self-evident or simple as one might think. In war, raging battles do not cease at sundown, nor do soldiers and sailors even need light to see their enemies in order to defeat them. Battles certainly have been fought at night and enemies have been defeated by strategy or maneuver alone far beyond the line of sight. War is more than a simple clash of men and weapons in combat; it is a complex enterprise involving numerous determinants. Although a spectacular, decisive battle may seem to be the climax of a war, behind it lie less spectacular but sometimes more important factors, like superior weaponry, better training, higher morale, or finer tactics. The art or science of war comprises more than battle drill; it includes other crucial determinants, such as logistics, strategy, and generalship, to name but a few. And what of light? Where does it fit into this complexity? How, for example, does light or its absence affect the morale of troops or judgments of their officers? Which weapons require light to be effective and which do not, and how in turn does this affect tactics and hence battles? There is more here than meets the eye (if you will forgive another pun).

If we are to investigate the effect of light on war, we should begin with the historical background of the subject, which specifically is my purpose: to explore the role of light in the history of warfare. By surveying military history, especially of the pre-modern era, we will uncover examples of how light has affected the events and circumstances of past warfare. Consideration of those historical examples will provide insights and help us to better understand how the phenomenon of light fits into military history.

Before searching, we should be certain of what we are looking for; otherwise, how would we ever know if we found it? We seek the impact of light on warfare, of course. But what is light and how can we measure its impact? Let us start by defining terms. Light, according to dictionaries and encyclopedias, is the physical phenomenon of radiant electromagnetic energy which is detectable to the eye thereby giving us sight. Although light's physical properties and behavior are quite complex, we can simplify for our purposes and consider light to be whatever enables us to see. Illumination, in short, any illumination. If it illuminates, it is light; if it brightens darkness, it is light. Light means sight.

This working definition covers the natural forms of light from the sun, moon, and stars, as well as the so-called artificial forms of light emanating from open flames and electricity. Not excluded are those non-human ranges of light or radiant energy to which modern technology has opened windows: the infrared, ultraviolet, and radio wave-lengths. Regarding these last, high-tech forms of light, keep in mind that they are relatively recent and have existed for only a small fraction of the total history of warfare. For over 5,000 years, until well into our own times, the only illumination available to civilization was the natural light from the sky or, closer to the ground, that chemical reaction of rapid oxidation that we call fire. Our search for the role of light in warfare covers chiefly the pre-modern time frame and the pre-modern forms of illumination.

Armed with our working definition of light, we need only consider one more preliminary before commencing our historical search: an approach. How should we approach military history with something as basic, pervasive, and commonplace as light? It is everywhere and affects everything; it illuminates the rich and the poor, the soldier and the civilian, the good guys and the bad guys. Like the air we breathe or the language we speak, light is constantly used but seldom analyzed. Like gravity, light is an elemental force of nature that we take for granted in daily life. When we actually do pay attention to such things, such as now, they loom large and amorphous, eluding easy understanding. How does one approach such overriding matters as air, language, gravity, or light? Where is the handle?

First we need to realize that such basic subjects seem conceptually unmanageable at first because they are taken for granted and rarely considered. Perhaps the very newness of thinking about such matters is disconcerting even inhibiting. Like the student in English class who discovered to his surprise that he had been speaking prose all his life, we need to go beyond surprise and do something with our discovery.

One useful approach is to eliminate the basic thing and consider its absence. We breathe, we speak, we fall down and not up because of air, language, and gravity. Take them away and what have we got? Aside from choking, silence, and levitation, we have a conceptual handle. Applying this handle to light, our basic subject, we find that its absence leaves us in the dark. Without light, there is darkness, and this simple revelation and fundamental fact will serve as a way to approach an understanding of the role of light in warfare. Let us begin our historical search not at dawn but at dusk and in the dark of night.

"War is carried on in the dark," said the Spartan king Archidamus about 25 centuries ago. He spoke figuratively, referring to the hard fact that battles are confusing and whatever can go wrong in war usually does. This military version of Murphy's Law is usually expressed as "fog of war," a term

which aptly describes the unfolding unpredictability of military events. However, in this case, the metaphor of "dark" fits better than "fog," especially if we consider it in the literal sense. Military operations have often occurred at night, in the dark.

The first recorded night operation occurred well over 3,000 years ago, about 1249 B.C. at Moreh in the ancient land of Israel. Many here may be familiar with the biblical account of how Gideon, son of Joash, led the Israelites to victory over the Midianites one dark night. With his small and outnumbered force, he stealthily surrounded the enemy camp while they slept and surprised them with the sudden noise of trumpets and battle cries and the light of torches. This stratagem worked so well that the confused and panic- stricken Midiantes counterattacked themselves and then fled in disorder, leaving Gideon the victor and us with fine first example of a night operation.

By coincidence, less than 50 miles from the spot of Gideon's triumph- -and 3,000 years later--another night attack took place. In 1918, during the First World War, a British brigade mounted a successful night raid on Turkish lines and, interestingly, also used deceptive noise and light. It is not so much the similarity to Gideon that should be noted but the 3,000-year time span between these two events. In between lies a large chunk of military history that includes numerous battles and operations undertaken without benefit of daylight. Throughout history, warfare has been carried out in the dark, literally.

Why, we may ask, all this fighting at night in the dark? Why not daytime when there is light to see? To be sure, events sometimes take control and dictate, for instance, that a battle begun in late afternoon may rage unabated into the dark of night. But when events allow a choice, why would a military commander opt for a night operation? The answer, in a word, is victory. Darkness offers advantages and opportunities for military victory that are unavailable in the revealing light of day; the night is a cloak under which military forces can operate unseen. Gideon wore this cloak well, as did other biblical commanders. Joshua once marched at night to position himself where the enemy did not expect to find him for the next day's battle. Judah once countered a night attack by lighting false campfires and luring his opponent into an ambush. With darkness as their ally, these biblical commanders were able to use surprise and deception to achieve victories.

On the other hand, darkness is an uncertain ally. The chief disadvantage is that figurative "dark" of war to which Archidamus referred, the unpredictability of military operations. At night, actual darkness compounds the potential confusion inherent in warfare. Thucydides, the ancient Greek historian and contemporary of the Peloponnesian wars, noted that

> In the daytime the combatants see more clearly; though even then only what is going on immediately around them, and that imperfectly--nothing of the battle as a whole. But in a night engagement...who could be certain of anything?

Still, despite the uncertainty and risks, the classical world of Greece and Rome included a number of commanders who operated at night. Herodotus, considered to be the first established historian, recorded many marches at night by the Greek armies during the Persian wars. On the other hand, Alexander the Great on one occasion notably refrained from attacking at night despite a tempting opportunity. Not all ancient commanders used such restraint. Pyrrhus, for example, not only gave us

the term Pyhrric victory (meaning so costly as to be a defeat in effect) but he also one night 25 centuries ago attacked a Roman army in Sicily with disastrous results. His troops lost their way in the dark and were caught off balance by daylight and the Romans. In contrast, Hannibal later successfully used night cavalry attacks to harass and weaken his Roman opponents, whom he easily defeated the next day.

From these ancient examples, we might conclude that the darkness of night offers only opportunities for victory; the commander has to decide when and how to take advantage of the dark. After withstanding prolonged sieges, fortified cites have been successfully stormed on a single night--the right night, of course. The Greek city of Syracuse was so stormed in 212 B.C. and, nine centuries later, a similar fate befell Antioch, which finally fell to the Crusaders one night in 1098 A.D. But many besieged cities did not fall, nor have all night attacks succeeded. Thus we must also conclude that darkness offers opportunities for defeat, especially as a result of confusion and self-inflicted mishap. Commanders have had to decide whether to risk the double-edged sword of darkness.

To complicate those command decisions, enter the technological factor. Employment of better weaponry has been a constant if uneven fact of military history, with the result being the development of more effective weapons. Spear throwers, war chariots, long bows, and cross bows come to mind before the gunpowder revolution of the late Middle Ages. Since then, bullets and shells swept and dominated the battlefield, enlarging it and making it more deadly. Massed muskets gave way to rapid-fire rifles and made the battlefield a killing zone in which to be seen by the enemy meant to become a target. By the mid-19th century, technology had created line-of-sight warfare, which changed tactics from close-packed formations to an extended open order. Despite the new tactics, the emerging modern battlefield remained a highly lethal environment.

Several survival alternatives appeared, one of which involved "digging in" and seeking protection from mother earth. During the American Civil War, Yankees and Rebels quickly learned the art of hasty entrenchment as they confronted the deadly new rifle-based firepower. The elaborate trench warfare that characterized the First World War epitomized this survival technique. Another alternative, of course, was to use the cover of darkness. Night operations increased in direct proportion to the improved efficiency of weapons.

Operating at night now offered more than just opportunity for surprise and deception but also protection from the dangerous firepower. Attacks carried out under cover of darkness denied defenders the opportunity to deliver accurately aimed fire. At the same time, their muzzle flashes acted as beacons pinpointing the defensive positions. None the less, these new advantages continued to be offset by Murphy's law and its nighttime intensifier. The opportunities for mishap remained, allowing troops to get lost in the dark (like Pyrrhus) or attack themselves (like the Midianites). With modern firepower, the accidental firing into one's own forces is a constant source of anxiety. So-called friendly fire, when delivered to the wrong side, becomes a tragic misnomer. Without the discerning illumination of light, chances for such mistakes only increase.

Understandably, then, some commanders have hesitated to undertake operations without benefit of daylight. Among notables, the Duke of Wellington, who defeated Napoleon at Waterloo, believed night attacks seldom succeeded. He once wrote:

> I have come to the determination, when in my power, never to suffer an attack to be made at night upon an enemy who is prepared and strongly posted, and whose posts have not been reconnoitered by daylight.

Another noteworthy, Frederick the Great, King of Prussia and military genius, whom some consider founder of Prussian and later German military excellence, put it bluntly and interestingly when he said:

> For my own part, I am determined never to attack by night, on account of the confusion which darkness necessarily occasions, and because the major part of the soldiery require the eye of their officers and the fear of punishment to induce them to do their duty.

Since we already know about the confusion factor, Frederick's other observation is the interesting one, that control of his troops in battle required light. Maintaining control over the close-order formations of Frederick's age were paramount military considerations; in order to deliver--and withstand--massed volley fire, the ranks had to remain steadfast. Such rigid discipline
was the responsibility of the officers, who not only had to see the soldiers but also be seen by them, and this required clear and steady light.

During Frederick's age and until the American Civil War, technology had not yet made the battlefield too deadly for massed formations. Within that era, the noted military strategist, Carl von Clausewitz prepared an entire if brief chapter on the subject of night operations. He relegated them to a minor role in warfare, suitable as raiding tactics for small, especially irregular forces or perhaps the secret positioning of regular forces before a daylight battle. According to Clausewitz, the unpredictability and confusion in military operations, "friction" as he called it, became too disruptive at night for sizable conventional forces. This left the night to the raiders, the guerrillas, the unconventional warriors who sought the protection of darkness to overcome their numerical or other weaknesses.

Although such thinking dominated western military theory, it did not necessarily hold true elsewhere. As American soldiers and marines fighting on Pacific islands during World War II discovered, their Japanese opponents showed a preference and prowess in night operations. Even if exaggerated, the Japanese proficiency in nocturnal combat, especially surprise attacks, goes back at least a thousand years in their military history. It continued into modern times, not as protection from increasingly deadly firepower but because the Japanese warrior tradition embraced close combat with sword and bayonet, for which darkness offered the best opportunity. Bear in mind, the effect of light or its absence on military affairs must pass through the filter of culture. The same light or darkness can serve different purposes depending on cultural factors or traditions.

Back in the Western military tradition, darkness provided the opportunity for what serves as a classic American example of a successful night operation. On Christmas night 1776, George Washington led his victory-starved remnant of an army across the icy Delaware River and early the following morning surprised the Hessian garrison at Trenton, NJ. A week later he repeated the night crossing maneuver, again using the cloak of darkness, but this time to deceive the British forces watching his empty but well-lit campsite while he surprised another British force in Princeton, NJ.

Washington's successes at Trenton and Princeton probably saved the American cause by delivering victories when they were desperately needed. Could those victories have been achieved in the light of day?

Daylight now deserves some attention. Thus far we have considered darkness only as a nighttime phenomenon. Other forms of darkness occur during the day, between the rising and setting of the sun. Fog, for example--the fog of nature, not war--blocks sunlight, obscures vision, and can serve as a cloak the same as night's darkness. Battles have been influenced by fog and mist, helping or hurting one side or the other depending upon circumstances. The great German counteroffensive in December 1944, known as the Battle of the Bulge, involved a significant fog factor, along with bad weather in general. It grounded all aircraft and thereby allowed German forces to make significant gains until the weather cleared and Allied air superiority could be unleashed. Although fog and mist obscure light and vision and thus affect battles, their appearance on the battlefield is fortuitous and not a reliable planning factor. The appearance of fog, in fact, is one of the many unpredictables that commanders must continually contend with. The "fog" of war has both literal and figurative applications.

A more dramatic form of daytime darkness is an eclipse of the sun, which suddenly turns bright day into dark night. Although eclipses create only momentary darkness and occur too infrequently for use as a protective cloak, these astronomical events have influenced military affairs. To the uninformed, eclipses are inexplicable and foreboding The sudden absence of daylight can unnerve troops. The Greek historian Herodotus recorded in 585 B.C. a battle during which an eclipse actually occurred. One of the contending forces, the Ionians, had been forewarned of the event and held fast, but the Medes and the Lydians on the other side, in Herodotus's words: "ceased fighting, and were alike anxious to have terms of peace agreed upon." Even the brief absence of light has determined a military outcome.

Eclipses block moonlight, too. As a major source of nighttime illumination, the moon has both helped and hurt military operations. Some commanders have avoided its revealing glare, whereas others have used it like a great lantern, enabling battles to be fought at night as if in daylight, such as in 63 B.C. when the armies of Pompey and Mithridates clashed near the river Euphrates under a bright moon. Beyond illumination, the moon has served ancient civilizations importantly as an omen, which in turn touched military affairs. By tying religious and political matters to phases of the moon, as did ancient Athens and Sparta, war plans and other military decisions became regulated by the waxing and the waning of the moon. In such cultures, an eclipse of the moon served as a portent that could somehow influence military campaigns. As one example, Livy, the great Roman historian, recorded the tribune who gathered his soldiers in camp one night to forewarn and reassure them about a predicted eclipse of the moon later on.

When thick clouds deny moonlight and starlight to military operations, the recourse is artificial light. The only source of artificial illumination available to the ancient world was firelight. Bonfires and torches--including rushlights, of course--enabled soldiers to operate in the darkness. Gideon, as we have already seen, used torchlight militarily over 3,000 years ago. The first formalization of firelight tactics appeared in a 5th century B.C. treatise by the legendary Chinese warrior and military

theorist Sun Tzu. He advised on how to prepare defensive bonfires around campsites so that they served as alarms, as deceptive devices, and as illumination for repulsing night attacks. He further advised:

> In night fighting use many torches and drums, in day fighting many banners and flags in order to influence the sight and hearing of our troops.

Here we find yet another military use for firelight as a means of communication and control. Commanders kept their troops oriented and maintained the integrity of formations in night actions through signal lights. Ancient combat was not simply a melee in which warriors hacked away at one another to the death. Commanders then as now try to orchestrate the events of an unfolding battle by shifting formations, committing reserves, and making other decisions that require knowing where the troops are and having a means of communicating those decisions. At night, firelight helped to serve this vital function.

Light has long been used for signaling. Since ancient times, lighthouses aided navigation with beacons of light to warn and orient. Warships communicated with each other by day or night with codes based on flashing lanterns. Land forces used the heliograph, which relies on sunlight reflected from mirrors to flash coded signals to distant observers. Alexander the Great may have heliographed messages while conquering Egypt, a land of constant sun. The modern version of the device appeared only about a century ago and transmitted its messages via sunlight where telegraph lines had not reached. The US Army employed it on the frontier, most notably in the southwest desert where in 1886 the heliograph helped capture Geronimo. His captor, General Nelson A. Miles, later to become the Army's top general, credited his demonstration of a heliograph with convincing the elusive Apache warrior that further resistance was futile in the face of such distance-conquering technology.

Focused sunlight can do more than communicate; it can destroy and serve as a weapon. Its destructive potential reputedly was demonstrated well over 2,000 years ago. During the siege of Syracuse in 212 B.C., Archimedes devised a large mirror that focused sunlight on the Roman fleet and burned it. So the story goes, but documentation for this fascinating event does not seem to exist and we must consider it as apocryphal. Even so, it helps us make an ancient-to-modern comparison by noting the similarity of Archimedes' alleged device to today's lasers. Both concentrate light and transform its illuminating properties into high energy power. The destructive capabilities of modern lasers and particle beams are not science fiction but ongoing experimentation.

Even without concentrating its power, illuminating light can still function as a military weapon or as part of a weapons system. Consider, for example, the canal defense project of World War II. The term itself was a deceptive pseudonym for a British-American experiment in night fighting. It featured specially adapted tanks outfitted with tremendously powerful lights that could suddenly flood a battlefield with intense illumination, blinding the enemy and screening the advance of friendly forces. Like the sudden absence of light during an eclipse, the sudden absence of darkness has military potential.

Consider now the familiar natural phenomenon of lightning, which is characterized both by sudden intense illumination and high-energy power. This discharge of electricity between cloud and earth is a weapon of tremendous destructive potential; however, its light and power await practical

application. (Theoretically, I suppose, someone could secretly install lightning rods in the enemy's camp and then wait for a thunderstorm; but this tactic may need some refinement.) Although lightning's power remains only a potential weapon, its illumination can affect military events. Lightning flashes brilliantly light up and expose the battle area at night, possibly giving away troop movements or revealing other activities being carried out under the cloak of darkness.

Military technology has paralleled lightning's illumination through chemical and electrical devices. Chemical flares at night imitate the brilliance of a lightning flash. Fired by mortars and attached to parachutes, these pyrotechnics slowly descend while exposing the entire battlefield with their harsh glare. Flares have been used militarily for well over a century, as have searchlights, which focus brilliant light on only a small portion of the battlefield. Searchlights at first consisted of crude mirrors and lanterns. Electric projector searchlights soon appeared in time for extensive use in the Russo-Japanese War of 1904- 05. Despite their narrow focus, searchlights can still illuminate an entire battlefield, as when in World War II their massed beams were "bounced" off low clouds to create a diffuse illumination. This artificial moonlight enabled American troops to cross swamps and rivers at night behind the lines. Predominantly, though, searchlights performed an antiaircraft role during the war, after which new electronic devices took over that role. Remember, radar and other forms of energy particles constitute "light" that we cannot see because they lie beyond the range of human eyesight. Nonetheless, we "see" such invisible light with the aid of our electronic machines.

Even with machines, however, the human eye can be fooled not to see something in broad daylight. Camouflage, the art of visual deception, does not need darkness to conceal; instead, it relies on light to let the observer see something else. The dazzle paint patterns on ships in the First World War, the splotchy color patterns on battle clothing, and the dull, nonreflecting colors of military field equipment all attempt to use light to reshape or otherwise disguise objects. This camouflage is useless in the dark.

It is now time to end this search of military history for the role of light. What have we found? In general, military attempts to penetrate the darkness with natural or artificial forms of illumination coexist with opposite attempts to deny that penetration. Depending on circumstances, military history reveals the use of light to see or its avoidance in order not to be seen. Light has played a dual role as both lantern and cloak. And whichever role it has played, light has been either ally or enemy to the military commander, who must determine how to use, avoid, or otherwise take into account this variable factor. Whether consciously or not, commanders have always had to deal with the military role of light. It is fitting and helpful for us to make them aware of the light factor in war

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