



**July 10, 2023**

*"Nobody ever heard of a quartermaster in history."* **Major-General Nathaniel Greene**, 1778 in a letter to Washington upon his appointment as Quartermaster of the Continental Army

*"Not to promote war but to preserve peace."* **Elihu Root**, 1902, motto of the US army War College, Carlisle Barracks, Pennsylvania

*"Who would have thought?" and "we shall know better another time."* **General Sir Edward Braddock**, after being mortally wounded, July 13, 1775

*"I hate cheering. If once you allow soldiers to express an opinion, they may on some other occasion hiss instead of cheer."* **Duke of Wellington**, 1815

*"Soldiers generally win battles, generals generally get the credit for them."* **Napoleon**, 1815

**Our speaker this month is Ron Courser, a Vietnam era draftee. He served from June, 1968 to March 22, 1970. Deployed to the Republic of Vietnam in March 29, 1969 to March 21, 1970. serving with the 4th Battalion, 23rd Regiment of the 25th Infantry Division (Mech). His MOS was 11B40-Infantryman Skill Level 4.**

**MEETINGS** take place the second Monday of every month at the **Downtown Holiday Inn**, 310 Pearl NW, Grand Rapids, MI 49504 (616) 235-7611. Socializing begins at 6:00 (1800 hrs), business meeting at 7:00(1900 hrs) dinner at 7:15 (1715 hrs), and program at 8:00 (2000 hrs). Ample free parking available

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**NOTE**

Within our Company we have members who have served in various branches from WWII up to the 21st Century. The military we once knew has changed in many cases. Nomenclature changes has made tracing unit histories difficult. The Naval Construction Battalions have undergone a dramatic metamorphous. Aside from getting smaller they have become more specialized. Likewise, Army units have undergone a similar change reflecting changes in missions and equipment.

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# Military Education

Prior to the establishment of British military academies, officers gained knowledge in their profession by reading the memoirs of previous leaders, both historically and contemporary. The Royal Military Academy Sandhurst was established in 1801, the USMA was founded in 1802; the Britannia Royal Naval College at Dartmouth was created in 1863 while the USNA was established in 1845. Before this period British officers had to rely on their own funds to purchase the historical accounts of military leaders as well as touring the former battlegrounds to learn more of their profession. Their next best choice was experience, in which there were ample opportunities.

Between 1745 and 1815, labelled by some as the ‘Seventy Years’s War,’ British troops bore arms on all continents of the globe. They fought in the wilderness of North America during the French and Indian War (1754-1760), as well as the American Revolutionary War (1775-1783); on the plains of Europe during the Seven Years’ War (1756-1763), the French Revolutionary War (1793-1802), and the Napoleonic War (1803-1815); and in a mixture of terrains—from jungles to deserts—in South Asia during the three wars in the Carnatic (Southern India, 1746-1763), four wars with Mysore (another Indian state, 1767-1799) and two wars with the Maratha Confederacy (1775-1782 and 1803-1805). Each campaign brought with it different challenges borne of terrain, environment and adversary.

Historian Huw W. Davies says “these challenges required innovative responses driven by the necessity of the soldiers, and the ambitions of their officers, and prompted by the different experiences of warfare in different parts of the world. In America the British redcoats gradually adapted to the conditions they faced by incorporating irregular tactics into their approach to warfighting and modified their uniforms and weaponry accordingly. In Europe, traditional Continental tactics and methods were formally adopted, but the combination of local circumstances and personal experience saw adaptations to these centrally proscribed doctrines. The collective experience of these wars on a global scale offered the British Army, or more precisely its officers and soldiers, a qualitative advantage in the creation, adaptation and application of the resultant ‘military knowledge’: a combination of formal training, institutional memory, professional educational and personal experience of war.

This knowledge was communicated through correspondence and reading, conversation and discussion, and reflected interconnected in philosophies by, among others, John Locke and David Hume. These philosophies helped drive the emergence of a military enlightenment in Europe marked by the notions of humanity, compassion and restraint in war. In Britain, as elsewhere, these notions were viewed and applied unevenly, but the emerging humanity exhibited between European adversaries was itself the product of the culture of *sensibilité*, which had come to be seen as the foundation for human knowledge and identity. As a result, the chivalric code, which had helped govern the practice of war since medieval times, was replaced by notions of respect, benevolence and compassion while waging war.”

The proponents of this philosophy, sensationists, believed that it was “meaningless to speak about things in which one had no personal experience. Ideas, not rooted in these experiences, in the senses, were mere delusions. So common soldiers with direct experience of war were better equipped to understand it than the socially superior armchair theorists.” Davies summarizes “therefore, experience, or sensation was seen to be the root of knowledge. Without such experiences it was impossible to acquire new knowledge, or remake existing knowledge.” The avid proponents of this

philosophy maintained that “the way knowledge was exchanged could be controlled through the application of pain or pleasure. Military personnel embraced these principles wholeheartedly, where the acquisition or experience... was privileged above any other form of knowledge creation.” They believed that “these principles helped officers and soldiers justify as punitive measures acts of brutality and atrocities against civilians, largely, though not solely focused on indigenous populations. And so, “education, such as that gained by reading and traveling, was sufficient for preparation, but it would never supplant the experience of war itself.

Experience, then, was seen to be central to knowledge creation during military enlightenment, and British soldiers had a uniqueness of experiences on which to draw. Britain’s uniquely global experiences of warfare in the 70 years between Fontenoy and Waterloo, generated military knowledge, on which no other army had access to. This helped also to promote experimentation with new ideas and facilitate the communication and exchange of those ideas. This knowledge was exchanged horizontally across ranks rather than up and down the chain of command. Occasionally, brilliant innovations were introduced by private soldiers, such as adjustments to uniforms or adaptations to weaponry to better suit the physical environment in which they were being used. Loose and informal knowledge networks were evident across the generations of officers and across the continents on which they served. Evidence exists through various means in Britain, Europe, North America and India.”

For example, “the simple idea of ordering troops to lie down, or use dead ground, to shield themselves from enemy artillery fire was used at the Battle on the Plains of Abraham outside of Quebec, September 13, 1759.” As the French, when they came within sight of the British line they deployed three cannon against the British. General James Wolfe ‘ordered the line to lay down till the enemy came close, when they were to rise up and give their fire.’ This tactic proved devastatingly successful. ‘The enemy, thinking by our disappearing, that their cannon disconnected us, they thought proper to embrace the opportunity...but received such a check that the smell of gun-powder became cautious.’ This tactic was reused a number of times over succeeding decades.” In listing the use of this tactic Huw Davies states that “these tactical decisions were unusual, taken by unorthodox commanders, which, as a violation of the traditional approach to line discipline of this era, was generally frowned upon. New military knowledge was created as a result of the experience of war, which in turn fostered a process of gradual improvement through speculative activity and experimentation with ideas learned in one theatre and applied in a new one. This was an uneven process. Experimentation carried with it a risk of failure, and in war there is a limited opportunity for refinement of intellectually risky actions.

This partly explains the emergence of different ‘schools’ of thought within the army, as the overwhelming conservative organization favored the tried-and-tested methods of the continental school, while the more innovative individuals of the American school sought to experiment with new ideas. This appears to be a story of two armies: the change-resistant organization versus the body of innovative individuals who sought to improve that organization.

In July, 1722, a British army was virtually wiped out in an ambush on the Monongahela river in the Ohio Valley. Its commander, General Sir Edward Braddock, was killed in action, and the Horse Guards, the title of British army headquarters in London, scrambled to find a replacement. General John Campbell, Fourth Earl of Loudoun, was tasked to meet the challenge posed by the French strategy of encirclement of the Thirteen British North American colonies and simultaneous incursions by hostile Native Americans. While trying to establish close cooperation with the colonies, man, train and equip defense forces and rebuilding the tattered reputation of the regular British Army. “In a country that was a vast inhospitable desert, unsafe and treacherous, where victories are not decisive and defeats are ruinous. Simple death is the least misfortune” as one veteran wrote.

# Light Infantry

Light infantry refers to certain types of lightly-equipped infantry throughout history. They have a more mobile or fluid function than other types of infantry, such as heavy infantry or line infantry. Historically, light infantry often fought as scouts, raiders, and skirmishers. These are loose formations that fight ahead of the main army to harass, delay, disrupt supply lines, engage the enemy's own skirmishing forces, and generally "soften up" an enemy before the main battle. Light infantrymen were also often responsible for screening the main body of a military formation.

The concept of a skirmishing screen is a very old one and was already well-established in Ancient Greece and Roman times in the form of the Greek *peltast* and *psiloi*, and the Roman *velites*. As with the so-called "light infantry" of later periods, the term more adequately describes the role of such infantry rather than the actual weight of their equipment. *Peltast* equipment, for example, grew steadily heavier at the same time as hoplite equipment grew lighter. It was the fact that *peltasts* fought in open order as skirmishers that made them light infantry and that hoplites fought in the battle line in a phalanx formation that made them heavy infantry. This *peltast* holds three javelins, which may have had straps to allow more force to be applied to a throw. One in his throwing hand and two in his shield (*peltte*) hand as additional ammunition.

The *psiloi* were the least prestigious military class deployed by the ancient world. A member of the *psiloi* was normally a man or boy from the lower ranks of his society, unable to afford the shield and armor of the hoplites, let alone the horse ridden by the socially elite cavalryman. Another term for a member of the *psiloi* was *gymnetes*, (*γυμνήτες*) literally: "naked".

In ancient Greece, the *psiloi* belonged to the poorest citizen classes; sometimes even unfree conscripts would be employed. They were armed with a variety of missile weapons and might have a dagger or short sword. The *psiloi* fought as skirmishers. Their task was to harass the enemy phalanx before the clash, to try to provoke disorder and protect their own lines from enemy skirmishers. They would be sent to occupy imposing terrain around and within the battlefield, as well as to disrupt the enemy in any way during his march, deployment or encampment. Just before the charge of the line, the *psiloi* would be recalled through the phalanx and deployed behind it or on its wings. They would

avoid close combat with more heavily armed opponents unless they had the advantage of especially favorable terrain. *Psiloi* could be used tactically, to constantly harass an enemy, unable to engage them.

Early regular armies of the modern era frequently relied on irregulars to perform the duties of light infantry skirmishers. In particular, the French Army employed detachments of German and Balkan mercenaries to serve as patrols in the rough country until a permanent corps of Mountain Fusiliers (*Fusiliers des Montagnes*) was raised in the 1740s. In the 17th century, dragoons were sometimes employed as the skirmishers of their day – mounted infantrymen who rode into battle but



dismounted to fight, giving them a mobility lacking to regular foot soldiers. In the 18th and 19th centuries most infantry regiments or battalions had a light company as an integral part of its composition. Its members were often smaller, more agile men with high shooting ability and capability of using initiative. They did not usually fight in disciplined ranks as did the ordinary infantry but often in widely dispersed groups, necessitating an understanding of skirmish warfare. They were expected to avoid melee engagements unless necessary and would fight ahead of the mainline to harass the enemy before falling back to the main position.

In colonial America the British became incensed when the French established a presence at the confluence of the Monongahela and Allegheny rivers in the Ohio Valley in 1754. Consequently the British government decided to send a force of regular troops to interdict the French strategy of encirclement by capturing Fort Duquesne. In the summer of 1775, General Sir Edward Braddock took command of two understrength British regulars—the 44th and 48th Regiments of Foot, supplemented by a colonial militia commanded by George Washington. Braddock was ordered to march his troops 120 miles from Hampton, Virginia through some of the most densely wooded terrain in North America, carving a new military road as they did so.

Many of the adaptations Braddock employed to survive in the wilderness would eventually help achieve success in North America from 1758 onwards. In anticipation of the harsh conditions his troops would encounter, linen waistcoats and breeches were issued instead of the conventional wool garments, while brown gaiters were worn to protect men's legs while cutting the road. Braddock also ensured that the load his soldiers each carried was considerably reduced. The men were permitted to leave behind their heavy leather shoulder belts and waist belts and carry only a linen haversack for rations, a tin canteen, a knapsack for personal kit and a blanket. Fusils—light and shorter muskets—became the weapon of choice as being more use in the Woody Country.

The regulars were deployed in what two years later would have been recognized as light infantry formations, small parties of men spread out into a skirmish line half a mile wide, with orders to sweep the flanks of the column, flushing out enemy fighters who concealed themselves the night before. Braddock became concerned that the march was going too slow so he split his force into two. The regular battalions, the Virginia militia, and the artillery moved swiftly ahead, while the remainder brought up the rear escorting the main supply train. Braddock's 'flying' detachment, numbering 2000 men, unencumbered by the supply train, would be able to move more rapidly and descend on the French fort, creating surprise and confusion.

On the morning of July 9, a few miles from the fort, Braddock ordered his men to ford the Monongahela. It took nearly six hours to get the whole party across. Once across the flying column arrived at a wide clearing about a quarter-mile from the river. There a small party of French and Native American warriors ambushed the British and American soldiers. Although the initial exchange of musketry favored the British, felling the French commander and causing some Canadian militia to flee, the remaining Indian/French force reacted quickly. They ran down the flanks of the column and put it under a murderous crossfire. The British vanguard, led by Colonel Thomas Gage, ordered his troops to form a line of battle but that proved ineffectual and they soon appeared to be struck with panic. The attackers were hidden behind trees at the edge of the clearing with the British and the Colonials badly exposed in the middle. As the ambush unfolded Braddock rushed to support his advanced guard, but faced with firing from unknown locations from the thick wood, accompanied by the fear-inducing yell of Native American warriors, the advance guard panicked and collapsed. The British attempted retreat, but ran into the rest of the British soldiers earlier left behind. Braddock rallied his men repeatedly, it was said that "he had five horses shot under him." The general fell at last, mortally wounded by a shot through the chest. Although the exact causes of the defeat are debated to this day, a contributing factor was likely Braddock's underestimation of how effectively the

French and Indians could react in a battle situation, and how rapidly the discipline and fighting effectiveness of his own men could evaporate.

With over 900 soldiers killed or wounded, including 60 of its 86 officers, the entire column fled back to the Monongahela. Robert Orme, one of Braddock's aides-de-camp, praised the British officers' calm and professional conduct in a very difficult and challenging situation, which was undone by the indiscipline of the colonial troops. George Washington, who commanded three Virginia Provincial Companies, firmly blamed the British regulars for the failure. "The dastardly behavior of the English Soldiers, exposed all those who were inclined to do their duty to almost certain death, and at length in despite of every effort to the contrary, broke and ran like sheep before the hounds. Any attempts to restore order were met with as much success as if we had attempted to stop the wild bears of the mountains." The Virginians, meanwhile, "behaved like men and died like soldiers." In defense of the English troops one must remember that they had been in country for less than two months after arriving from the plains and farmlands of Europe.

Two of the surviving British officers admitted that the redcoats were in a bad position, trapped in a valley, and they had exhausted their ammunition during this 3 hour standoff. Continuing to summarize the fiasco Colonel Gates concluded that it was "the novelty of an indivisible enemy & the nature of the country, which was entirely a forest. The Native Americans were firing from behind trees, and with nothing to aim at, our soldiers discharged their weapons at anything that moved: more often than not, other British soldiers. Their blood-curling yells had never been experienced and were a great hinderance to good order." The Virginians, on the other hand, were more than familiar not only with the terrain but also with their enemy's tactics.

An article published in The Roanoke Times on April 15, 1951, claims that Braddock was shot dead by an American soldier called Benjamin Bolling. According to the article, Bolling intentionally shot Braddock to protect the lives of his fellow American soldiers during the ambush, as British troops were firing at American troops under the mistaken impression that they were actually French troops due to the fact that many Americans had taken cover in the tree line. The death of Braddock then allowed for Washington to take command and order a retreat, which, according to the article, allowed for the Americans to fall back without being further fired upon by the confused British, saving many of their lives.

Braddock was buried just west of Great Meadows, where the remnants of the column halted on its retreat to reorganize. He was buried in the middle of the road that his men had just cut through and wagons were rolled over top of the grave site to prevent his body from being discovered and desecrated by the Indians. George Washington presided at the burial service. In 1804, human remains believed to be Braddock's were found buried in the roadway about 1.5 miles west of Great Meadows by a crew of road workers. The remains were exhumed. A marble monument was erected over the new grave site in 1913 by the Coldstream Guards.

A perception emerged in the wake of the battle that regular European continental drill methods were inadequate to the challenges posed in America. This perception drove a debate which dovetailed with the new and innovative thinking emerging from Europe. But the British were slow to embrace the concept irregular forces. The Europeans began accepting the value and utility of irregular forces. Frederick the Great had formed the *Feld Jäger Corps*, levied from Central European hunters, skilled in the use of rifles, while the French formed the *chasseurs à pied*. These units were used to supplement and compliment the armies in the regular order of battle. In the absence of a formal doctrine issued from the Horse Guard in London, the only benefit the average soldier could gain was from the hard experiences brought to them from officers who had been serving in North America. Hence, when the Hessians arrived years later, most were used for guard duty while a limited number saw combat, much to their detriment.

# World Terrorism Alert Levels

The following is reprinted from a December 2011 Cannon Report. Deno Sellas was Commandant, Jason Porter was the XO, James Henningsen was adjutant, Boyd Conrad was our Judge Advocate and José A. Amorós was the editor. His staff included Tom Sutter and Guy Greene with Bill Alexander listed as the Editor Emeritus. Names from long ago but fondly remembered. Recall when reading the following, these comments are from 2011.

The English are feeling the pinch in relation to recent events in Libya and have therefore raised their security level from "Miffed" to "Peeved." Soon, though, security levels may be raised yet again to "Irritated" or even "A Bit Cross." The English have not been "A Bit Cross" since the blitz in 1940 when tea supplies nearly ran out. Terrorists have been re-categorized from "Tiresome" to "A Bloody Nuisance." The last time the British issued a "Bloody Nuisance" warning level was in 1588, when threatened by the Spanish Armada.

The Scots have raised their threat level from "Pissed Off" to "Let's get the Bastards." They don't have any other levels. This is the reason they have been used on the front line of the British army for the last 300 years.

The French government announced yesterday that it has raised its terror alert level from "Run" to "Hide." The only two higher levels in France are "Collaborate" and "Surrender." The rise was precipitated by a recent fire that destroyed France's white flag factory, effectively paralyzing the country's military capability.

Italy has increased the alert level from "Shout Loudly and Excitedly" to "Elaborate Military Posturing." Two more levels remain: "Ineffective Combat Operations" and "Change Sides."

The Germans have increased their alert state from "Disdainful Arrogance" to "Dress in Uniform and Sing Marching Songs." They also have two higher levels: "Invade a Neighbor" and "Lose."

Belgians, on the other hand, are all on holiday as usual; the only threat they are worried about is NATO pulling out of Brussels.

The Spanish are all excited to see their new submarines ready to deploy. These beautifully designed subs have glass bottoms so the new Spanish navy can get a really good look at the old Spanish navy.

Australia, meanwhile, has raised its security level from "No worries" to "She'll be alright, Mate." Two more escalation levels remain: "Crikey! I think we'll need to cancel the barbie this weekend!" and "The barbie is canceled." So far no situation has ever warranted use of the final escalation level.

-- The preceding was written by John Cleese - British writer, actor and tall person.

# Bowyer, Fletcher and Bodkins

In 1066 a Norman-French army, led by William the Conqueror, invaded England. The Anglo-Saxon English lost a battle at Hastings, in East Sussex, on the shores of the English Channel. For the next 350 years there was almost a continuous struggle for control of the lands in northwest France and the British Isles. Until the early 17th century there were no standing armies. When rulers chose to go to war they taxed their population and hired mercenaries and fought till they won or ran out of money. To ensure compliance of the almost 2 million Englishmen William imposed a rigid caste system and took a meticulous census of all the citizens and their possessions, known as the Domesday Book. This recorded the wealth of some 13,000 settlements down to the last goat and hen, so that an unavoidable tax burden could be levied. William stole some 5,000 estates from their Saxon owners along the borders of Scotland and Wales and in the so-called Pale region of Southern Ireland and gave them to the Normans in return for their pledge to fight for him whenever needed. Only the mountain regions of Wales remained as the last redoubt of the native British.

During the next 3 1/2 centuries combat skills and methods changed dramatically. Swords, spears and lances were the predominate weapon of the infantry. Mounted infantry became the cavalry and frontal assaults were more carefully planned due to the ability of the cavalry to flank the soldiers. The next development was revolutionary. The Welsh bow was a weapon used by Welsh mercenaries as documented by Gerald of Wales about 1188. They were usually made of elm. On the left is an illustration of a 13th century Welsh bowman. By the 14th century the English had a more powerful type of bow, about 6 ft long and was the dominate weapon from 1250 to 1450. The British began to develop the medieval war-bow in the late 14th century to counter heavy cavalry charges. A longbow must be long enough to allow its user to draw the string to a point on the face or body, and the length therefore varies with the user.



The average bow of this type was able to draw a weight of about 120 pounds when a 28 inch arrow was at full tension just before release. Only an abnormally powerful person was strong enough to achieve such a draw action. Professional archers' bodies were lopsided as a result of years of practice. The power of their fist-grip was vice-like, and they used three, not two, fingers on the bowstring.

The preferred material to make the longbow was yew, because of its particular ability to return to shape, meaning its elasticity. Yew logs were mostly imported from Italy, Ireland and Spain. Professional bowyers would then split the logs into staves some 7 feet long and 3 inches thick then apply wax to prevent splits. They would then dry the yew wood for 1 to 2 years, then slowly work it into shape, with the entire process taking up to four years. Different bowyers had special ways of shaping their bows, and their apprentices were sworn to secrecy never to reveal these skills. The bow stave is shaped to have a D cross-section. The outer "back" of sapwood, approximately flat, follows the natural growth rings. The inner side ("belly") of the bow stave consists of rounded heartwood. The heartwood resists compression and the outer sapwood performs better in tension. This combination in a single piece of wood (a self bow) forms a natural "laminate", somewhat similar in effect to the construction of a composite bow. Longbows last a long time if protected with a water-resistant coating, traditionally of "wax, resin and fine tallow".



The trade of yew wood to England for longbows was such that it depleted the stocks of yew over a huge area. The first documented import of yew bow staves to England was in 1294. In 1470 compulsory practice was renewed, and hazel, ash, and laburnum were specifically allowed for practice bows. Supplies still proved insufficient, until by the Statute of Westminster 1472, every ship coming to an English port had to bring four bowstaves for every ton. Richard III of England increased this to ten for every ton. This stimulated a vast network of extraction and supply, which formed part of royal monopolies in southern Germany and Austria. In 1483, the price of bowstaves rose from two to eight pounds per hundred, and in 1510 the Venetians obtained sixteen pounds per hundred. Forestry records in this area in the 17th century do not mention yew, and it seems that no mature trees were to be had. The English tried to obtain supplies from the Baltic, but in this period bows were being replaced by guns in any case. Bowstrings were made of hemp, flax or silk, and attached to the wood via horn "nocks" that fit onto the end of the bow.

Longbows were very difficult to master because the force required to deliver an arrow through the improving armor of medieval Europe was very high by modern standards. Although the draw weight of a typical English longbow is disputed, it was at least 81 pounds-force and possibly more than 130 pounds. Considerable practice was required to produce the swift and effective combat shooting required. Skeletons of longbow archers are recognizably affected, with enlarged left arms and often osteophytes on left wrists, left shoulders and right fingers. It was the difficulty in using the longbow that led various monarchs of England to issue instructions encouraging their ownership and practice, including the Assize of Arms of 1252 and Edward III of England's declaration of 1363: "Whereas the people of our realm, rich and poor alike, were accustomed formerly in their games to practise archery – whence by God's help, it is well known that high honour and profit came to our realm, and no small advantage to ourselves in our warlike enterprises... that every man in the same country, if he be able-bodied, shall, upon holidays, make use, in his games, of bows and arrows... and so learn and practice archery."

The range of the medieval weapon is not accurately known, with much depending on both the bow and the type of arrow. It has been suggested that a flight arrow of a professional archer of Edward III's time would reach 400 yards. The longest mark shot at on the London practice ground of Finsbury Fields in the 16th century was 345 yards. In 1542, Henry VIII set a minimum practice range for adults using flight arrows of 220 yards; ranges below this had to be shot with heavy arrows.

A typical military longbow archer would be provided with between 60 and 72 arrows at the time of battle. Most archers would not shoot arrows at the maximum rate, as it would exhaust even the most experienced man. "With the heaviest bows an archer does not like to try for more than six a minute." Not only do the arms and shoulder muscles tire from the exertion, but the fingers holding the bowstring become strained; therefore, actual rates of shooting in combat would vary considerably. Ranged volleys at the beginning of the battle would differ markedly from the closer, aimed shots as the battle progressed and the enemy neared. On the battlefield English archers stored their arrows stabbed upright into the ground at their feet, reducing the time it took to nock, draw and loose. Arrows were not unlimited, so archers and their commanders took every effort to ration their use to the situation at hand. Nonetheless, resupply during battle was available. Young boys were often employed to run additional arrows to longbow archers while in their positions on the battlefield. The longbow was the machine gun of the Middle Ages: accurate, deadly, possessed of a long range and rapid rate of fire, the flight of its missiles was likened to a storm.

A craftsman who makes arrows is a fletcher, and one that makes arrowheads is an arrowsmith. Fletching is the fin-shaped aerodynamic stabilization device attached on arrows, bolts, darts, or javelins, and are typically made from light semi-flexible materials such as feathers or bark. Traditionally, the fletching consists of three matched half-feathers, 8-12 inches long, attached near the



back of the arrow or shaft of the dart that are equally spaced 120° degree intervals around its circumference. In English archery, the male wing feather, from the grey goose, is used on the outside of the arrow, while the other two stabilizing feathers are from a female, or hen.

Arrow sizes vary greatly across cultures, ranging from eighteen inches to six feet but most were at least 30 inches long. The shaft is the primary structural element of the arrow, to which the other components are attached. Traditional arrow shafts are made from a strong, lightweight wood, bamboo, or reeds. Sometimes a shaft will be made of two different types of wood

fastened together, resulting in what is known as a footed arrow. Footed arrows were used both by early Europeans and Native Americans. Footed arrows will typically consist of a short length of hardwood near the head of the arrow, with the remainder of the shaft consisting of softwood. By reinforcing the area most likely to break, the arrow is more likely to survive impact, while maintaining overall flexibility and lighter weight.

The arrowhead or projectile point is the primary functional part of the arrow, and plays the largest role in determining its purpose. Some arrows may simply use a sharpened tip of the solid shaft, but it is far more common for separate arrowheads to be made, usually from metal, horn, or some other hard material. A bodkin point is a type of arrowhead. In its simplest form it is an uncomplicated squared metal spike, and was used extensively during the Middle Ages. The typical bodkin was a square-section arrowhead, generally up to 4.5 inches long and 0.39 inches thick at its widest point, tapered down behind this initial "punch" shape. Bodkin arrows complemented traditional broadhead arrows, as bodkin point arrows were designed to defeat mail armor while broadhead point arrows caused more serious wounds and tissue damage. At the Battle of Crecy, 1346, 4000 English archers were provided with over 300,000 arrows with heads attached.



**Bodkin point**

contained twenty-four arrows tied up with hemp cord, which archers reused to tie the arrows around their waists for battle.

During the battle many boys were sent out onto the battleground to retrieve the spent arrows for they had depleted their supply. Blacksmiths had made over 2 million Bodkin points in the two years prior to the Battle of Agincourt, 1415. The weight of all those arrows had caused many of the carts of the supply trains to collapse under their weight. Each archer in an English army during the 15th century was issued with a bow, between two and five bowstrings and two sheaves of arrows for each campaign. Each sheaf