IQP-48-JLS-0062

Pikes for the People: An Interactive Pike Demonstration

Interactive Qualifying Project Proposal

Submitted to the Faculty

of the

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for graduation

by

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February 14, 2010

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Abstract

This project developed an interactive demonstration for the Higgins Armory Museum to give patrons an engaging and educational experience that will help them understand how the evolving role of the footsoldier in late medieval warfare affects them today. In addition to a training and teacher handbook detailing all aspects of the demonstration, the team also produced other supporting materials for the demonstration, including a website, a digital primary-source interactive and detailed background research documentation.

Introduction

The Higgins Armory Museum currently has a wide array of demonstrations and artifacts which give its patron an awed sense of the knight being a gallant almost invincible warrior throughout medieval and renaissance Europe. The goal of this project was to dispel that illusion and give the Armory a way of showing its patrons who the real muscle of the late medieval and early Renaissance army was. The project developed an interactive, hands-on demonstration for the museum based around the concept of late medieval pike drill used by ordinary footsoldiers. The demonstration was designed to offer patrons an engaging and educational experience that will help them understand how the evolving role of the footsoldier in late medieval warfare affects them today. In addition to a training and teacher handbook detailing all aspects of the demonstration, the team also produced other supporting materials for the demonstration, including a website, a digital primary-source interactive and detailed background research documentation.

Where previously land was dominated by the nobility and the battlefield by the knights, this new era gave power to the common man both in the civilian and military worlds. In the civilian world it was a time of renewed art and culture, a renaissance; on the battlefield it was the time where the common man could defeat the knight in battle. Several of Europe's oldest democratic nations can trace themselves back to the era. Switzerland was one of the first democratic nations of medieval Europe.

The 1400s were also the beginning of what could be described as a combined arms military. Modern militaries are composed of coordinated branches and divisions that can be combined in various ways on the battlefield. This idea draws on the assembly line concepts developed during the industrial revolution which in turn drew their ideas from the concepts military of the 1400s. This concept of specified roles and interchangeable and replaceable units of soldiers has lasted through the ages. Even today the U.S. as well as many other nations are able to train soldiers from raw recruit to "boots on the ground" combat ready in a relatively short time period.

The pike man symbolized another implication of this specialized soldier who was beginning to dominate the

battlefield. A knight not only represented a significant time investment, but also a great financial one. His armor, his horse, his training and upkeep, all cost a significant sum of money. A pike man, however, could be equipped cheaply, trained cheaply, and since he was a common man, often he would support himself in times of peace. Dominance of the pike represented a shift from the use a few high quality soldiers, to great numbers of cheaply mass produced soldiers.

The goal of this demonstration is to show patrons of the Higgins Armory Museum just how important pike man and the tactics they employed were to the warfare and society of the 1400s. Not only is it the hope that the patrons have a fun and educational experience, but also that they are able to understand how these changes in warfare and society continue to affect them today (i.e. how pikes evolved into bayonets, how infantry men wielding such weapons as the pike could overtake highly trained knights on the battlefield). The team also produced a large amount of documentation relating to the demonstration. The Handbook details all aspects of the demonstration, and has been organized in such a way that it could be modified and reproduced by the armory staff. In addition to the handbook an extensive amount of background documentation was generated through many weeks of research by each of the project team's members.

The demo itself is composed of three basic parts. The first is an introduction to catch the attention of the audience. The presenter loudly draws them in and gives a brief overview of the time period. He then announces their recruitment and hands them wooden halberds. This leads to the second portion of the demonstration. Those audience members who elected to step forward are run through the most rudimentary of pike drills. After this the third section simulates members of the pike block dying and being replaced. The presenters then tie up the demonstration with a brief conclusion.

There was also website and interactive element generated to accompany the presentation. The website includes pre and post visit materials which are designed to go along with the presentation (i.e. patrons would go through the pre visit material before coming to the armory, and go over the post visit materials after leaving). The interactive element is meant as a way of allowing the patrons to find out more about the weapons and soldiers of the time by viewing an image. When certain parts of this image are scrolled over by a mouse, a close up of the highlighted section pops up, giving the user a brief description.

This demonstration drives home a powerful point. That this time in history was a turning point for western society. The knights were slowly relinquishing the battlefield to the trained infantryman. The idea of having a single place in society crafted for a single individual gave way to the idea of people being interchangeable. At the core of this change, was the man who this presentation seeks to call attention too, the pike man.

Acknowledgements:

We would like to thank the following for their support and contributions to our project:

Amanda Connor, originally the fifth team member of the IQP, who dropped during A term. She helped by contributing to the PQP and some of the original research.

The staff of Higgins Armory. Namely Professor Forgeng, Curator of the Higgins armory museum and advisor to the IQP team. He allowed us access to the Higgins armory collections and taught us the pike drill which eventually evolved into our final presentation. Also introduced us to all contacts we used throughout the project. He participated in a few of the presentations as well. Devon Kurtz, head of the Higgins Armory education department for his giving direction to the development of the presentation. To Neal Bourbeau of the Education department for his assistance with costuming for the presentation. Also, Alan Catalano for providing access and training in the armory library.

The Wolfe Argent group for its support and assistance on numerous occasions. In particular, Peter Kliem for assisting with a demonstration and lending costuming equipment. Morgan Kuberry for helping out in one of the early demonstrations. Also, to Bob Reed, King of Wolfe Argent and all around swell guy, who provided many of the suggestions for primary materials used. Also provided many tips in presenting and helped out with demonstrations.

Also to Salem Trained Band, who first explained how a pike was made and allowed us to see and hold a replica pike; also gave tips on presenting

The Evolution of Military Organization and the Rise of Military Professionalism

By Huan Lai

The evolution of military organization and the rise of military professionalism

The Late Middle Ages was a time of radical change in European history. During this time, the feudal knights that dominated the battlefield were being replaced by well trained and equipped infantry units. National or feudal conscription was being gradually replaced by mercenary and professional soldiers. Military organization evolved towards a system of contractual relationships and professional soldiers.

Prior to the Late Middle Ages, knights had dominated the battlefield. An army of a few hundred knights could be considered a formidable force, often sufficient to conquer and rule. But as Europe entered the Late Middle Ages, well trained and equipped pikemen became more and more effective against the seemingly invincible knightly cavalry. Technological developments in crossbows and gunpowder weapons also assisted in the downfall of the knight in shining armor. Serving as an equalizer in the battlefield, the crossbow allowed even a commoner to knock a knight from his horse from a distance. Because of their declining effectiveness, it became less and less militarily and economically viable for knights to continue to exist.

With the weakening of knightly supremacy in war, there was a growing need for larger armies that were better trained and equipped. The old system of conscription and feudal obligation was not sufficient to defend against wandering bands of armed men attacking and plundering towns and cities. Because of their lack of experience, town militias were obviously less formidable soldiers than the professionalized warriors who were plundering from the cities. “As a result the town militia that in the twelfth and thirteenth centuries defended Italian cities against all comers began to give way to hired bands of professional fighting men” (McNeill, 73). The system was made economically sustainable by the fact that the money that the citizens taxed themselves to pay the mercenaries was usually put back into circulation by the spending of the soldiers while they were spending their time in the cities that they were defending. The situation was mutually beneficial. The citizens much preferred the certainty of taxes over the uncertainty of being attacked and plundered, not to mention the more professional fighting men being hired as defenders, the less that are

wandering the countryside plundering. The professional fighting men preferred the certainty of the pay for protection over the uncertainty of living purely off plunder.

The Italian cities developed differently from that of the larger sovereigns to the north. Prior to the Late Middle Ages, the system of mercenaries was gradually declining in many of the Northern European states. The decline of the bands of routiers that raided the countryside and the prevailing power of the monarchies, combined with the extended period of peace, decreased the need for mercenaries. With the Hundred Years War, the need for mercenaries again rose, but they were mostly hired from the Low Countries, where they never lost their appeal (Prestwich, 153-157). And while the larger sovereigns of Europe had still maintained their national armies, the Italian city states had almost completely converted to using mercenaries and defensive contracts.

As the system of mercenaries became more deeply ingrained into society, more efficient systems had to be developed. The initial problem with mercenaries was their lack of stable structure. Another initial problem with mercenaries was "that their willingness to fight in return for financial compensation somehow violated the tenets of feudalism, that currency-driven service made them into immediate pariahs" (Isaac, 101). Because they were fighting solely for financial compensation, mercenaries lacked loyalty. Even during their contractual relationship, both the employer and employee constantly had to prepare for the possibility of today's ally becoming tomorrow's enemy at the end of the contract. During the early stages of the new market-based military system, most contractual relationships were very short. It was common practice for cities to hire captains for a single campaign or even shorter, who would then hire and command a body of troops purely for that campaign. "The ready availability of such mercenaries, often seeking employment during truces in northern wars, encouraged the city-states to dispense with their services as soon as possible at the end of the campaigning season and to give little thought to the problems of longer-term defense" (Mallett, 69).

Because the instability of these short-term contracts that lasted for a single campaign or less was uncomfortable for both sides, longer-term contracts became more and more necessary. In addition, short-term contracts weren't cost-efficient; the constant shifts of employers and the uncertainty of future employments for the captains and professional solders and increased costs to the cities. As time progressed, soldiers became more regularly employed with the same captain, leading to standardization of personnel and equipment and more organized standing armies of known size and capability. More loyalty between a captain and the men under his command developed. Also, long-term relationships between

cities and captains became normal. Cities were beginning to “abandon the old policies of giving short-term contracts to any available captains, and to try seriously to retain the loyalty of the outstanding captain of the day” (Mallett, 71). Sometimes relationships of repeated contract renewals resulted in lifetime service. Cities were moving away from simply hiring mercenaries and moving towards hiring professional standing armies. The military system, which had started as a free market where plundering determined the cost of protection, had evolved to an oligopoly where a few great captains and city administrators were entire in charge of all contractual agreements.

As time progressed however, this system proved to have problems as well. Because the cities had no military power themselves, other than their hired armies, and the loyalty of the soldiers was to their captains and not with the city they were defending, civic officers of these cities were always under the fear of coups d’état. The most famous of this was the hostile takeover of Milan in 1450 by Francesco Sforza. Some other cities, such as Venice, managed to avoid this by taking careful countermeasures. By giving civic honors and gifts and arranging marriages with members of the aristocracy, captains were kept happy. Contracts were also split amongst several mutually jealous captains, preventing any one captain from being able to become powerful enough to overthrow the city (McNeill, 76).

The weakness of the workaround was that no single captain could be appointed as commander-in-chief without causing problems with the other captains. This reduced the capabilities of the cities armed forces as a whole. With improvements in technology, especially gunpowder siege weaponry, a more organized single military structure became more and more important. Siege technology evolved rapidly, requiring significant investments to stay up to date, something that isn’t possible when the military is split into multiple rival units. Previously, defensive fortifications had been sufficient, and sieges of highly fortified cities were close to impossible. But with each new generation of siege weapons, existing fortifications became useless.

By the 1480s, cities were beginning to contract with smaller and smaller units, allowing them to appoint officers who depended upon the civic officials instead of captains. This allowed the civic officials more power over the armed forces, significantly decreasing the threat of coups d’état. And because the state held the power of hiring and promoting soldiers into long-term relationships, the armed forces became solely loyal to the state. The military system was now moving towards a quasi-monopoly within each of the states, giving full power to the city administrators (McNeill, 77). Across Europe, the civil governments were taking more and more control of their armed forces.

In the nation-states of Western Europe, the need for larger and more diverse armies with the weakening of the knight was much more easily met than in the Italian city-states. Because of their better access to resources and larger populations, the nation-states began to militarily prosper towards the end of the Late Middle Ages. They had better access to mines to develop gunpowder siege weaponry. They also had larger populations, capable of raising large armies of diverse arms and formations, necessary for the coming era.

With the organizational structure of states' armed forces becoming more centralized and rigid, combined with the increasing ease of attacking previously impregnable fortresses, the dominance of the Italian city-states began to disappear. Larger states capable of massive military investments, such as France, England and the Ottoman Empire took off. "In Europe, the major effect of the new weaponry was to dwarf the Italian city-states and to reduce other small sovereignties to triviality" (McNeill, 89). This rapid development of the Late Middle Ages, originally led by the Italian city states and later dominated by the large European empires, prepared Europe to enter the Early Modern era as the dominant force on the world stage.

Technological Development and Its Effects on Warfare

Technological development caused significant changes to European warfare. Changes propagated to all aspects of the military. The first major technological breakthrough is the adoption of the crossbow, which helped to dethrone the knight as dominant force of the battlefield. From there, developments in gunpowder weapons gradually changed the nature of warfare, especially from the perspective of siege warfare. But as offensive weapons were being developed at a rapid pace, defensive techniques and technologies to counter those weapons were also being developed. Because of the cost of research and development required to keep up with the rapidly evolving technology, certain nations with more abundant resources boomed.

The development and evolution of the crossbow was an inevitable, yet repressed one. "Aristocratic pride originally dictated that, even though lesser men might fight with edged weapons – the infantryman's pike or halberd – the knight could not use missile weapons without bringing dishonor upon himself" (Hall, 15). The weapon was even "banned at the Second Lateran Council (1139) as being too lethal for Christians to use against one another" (McNeill, 68). And while they had served as a decisive force, especially against Muslims

who had lacked the technology during the Crusades, as well as many other battles throughout Europe, crossbowmen received little to no recognition for their achievements.

Despite this, the effectiveness of the crossbow was undeniable, not to mention constantly improving. In contrast with the longbow, which required a lifetime of training, the crossbow was usable by a commoner with weeks, or at worse months, of training. And while it was easy to use and didn't require a significant amount of strength to operate, crossbows were able to shoot far distances and even pierce armor at close range. The crossbow did have a major flaw in that the firing rate was significantly lower than that of a regular bow, at only about one bolt per minute (Hall, 18). Because of this flaw, crossbows coexisted alongside longbows, instead of completely replacing them.

Towards the end of the Late Middle Ages, improvements in metallurgy and other technological advancements allowed gunpowder weapons to become more and more commonplace on the battlefield. "Hand-held gunpowder weapons were also beginning to appear on the battlefield…so conventional had they become, in fact, that in January 1456, when Philip the Good, duke of Burgundy, was planning a crusade against the Turks, he included among the soldiers 500-600 gunners outfitted with hand-held weapons" (DeVries, XI 122). Gunpowder was more widely known, with better recipes being written, some specifically for different guns. Hand-held gunpowder weapons served a very similar role to crossbows; they were powerful missile weapons that were easy to use without significant training. They also suffered from the same weakness as crossbows, significantly slower fire rates than bows. Even by the end of the era, gunpowder weapons did not gain much traction as infantry weapons.

Medieval hand-gun from the 15th century.
http://herotod.wordpress.com/category/renaissance/

While gunpowder weapons did not make much of an impact on infantry warfare, they had a significant impact on siege warfare. Prior to the rapid adoption of gunpowder, it "took a matter of weeks and months for a substantial fortification to be reduced" (Prestwich, 11). Previously, sieges were generally wars of attrition; with little way of breaking down the fortifications, the best method of capturing a city was by simply blockading it until the citizens were forced into surrender by starvation. But with the advent of cannons and other gunpowder-based artillery, "on the single occasion when a fortress on

the border of the kingdom of Naples did try to resist the invaders, the French gunners required only eight hours to reduce its walls to rubble. Yet not long before, this same fortress had made itself famous by withstanding a siege of seven years" (McNeill, 89). The balance of power had completely shifted between the besieger and the besieged.

To counter the destructive capabilities of the new siege weapons, changes were made to fortifications. Unfortunately, with every new breakthrough made with siege weaponry, existing fortifications would once again be rendered completely vulnerable. This created an expensive cat-and-mouse game that wasn't easily afforded by most fortifications. "It was both too expensive and time-consuming to rebuild all fortifications to meet the attacks of gunpowder weapons. Therefore, the initial move was to outfit these fortifications with guns as a defense attacking gunpowder weapons" (DeVries, XIII 233). These gun ports in fortresses were generally not sufficient to defend against most gunpowder bombardments. Especially towards the end of the fifteenth century, guns became more powerful and more accurate.

One strategy taken by towns and castles was simply to make thicker walls, sometimes with masonry and sometimes with piles of earth, or to increase the size of the ditches surrounding their fortifications. This was usually more expensive than most could afford, however, and wasn't very effective against the rapidly developing artillery. A very popular approach was to simply build more defensive structures with defensive artillery that was separate from the castle and town walls, meaning their collapse didn't entail the collapse of the fortification. These defensive fortifications came in many flavors. The simplest fortifications were boulevards, which were low earthwork defenses placed before a vulnerable gate or wall. The second was the artillery tower, which were complete towers with gun ports and a large number of gunpowder weapons placed at the most exposed parts of a fortification. In addition, bastions were built at corner of and extending beyond the fortification walls, providing flanking fire against attacking artillery (DeVries, XIII 237-243).

http://www.dmna.state.ny.us/forts/glossary/bastion.htm

"In Europe, the major effect of the new weaponry was to dwarf the Italian city-states and to reduce other small sovereignties to triviality" (McNeill, 89). Because of the cost of the research and development of these new weapons, a tremendous gap between the largest and smallest nations began to form. And because the supply of mining sites for metals required

for cannon manufacturing, “as soon as guns became critical weapons of war, Italian technical primacy in the armaments industry decayed” (McNeill, 81). During and before the fourteenth century, gunpowder weapons were still under complete local control in France and the Low Countries. In England however, it was exclusively under royal possession. Towards the end of the fifteenth century, large sovereigns were beginning to nationalize siege weaponry development, after seeing their power and importance (DeVries, XVI 130-144).

The rapid growth of gunpowder weaponry expanded to all aspects of warfare. Siege warfare had already been completely dominated by gunpowder technology, and infantry weaponry and naval weaponry were also beginning to utilize the power of the new development. By fully taking advantage of their dominance in gunpowder technology, large European sovereigns prepare themselves to enter the Early Modern era as the most militarily powerful forces in the world.

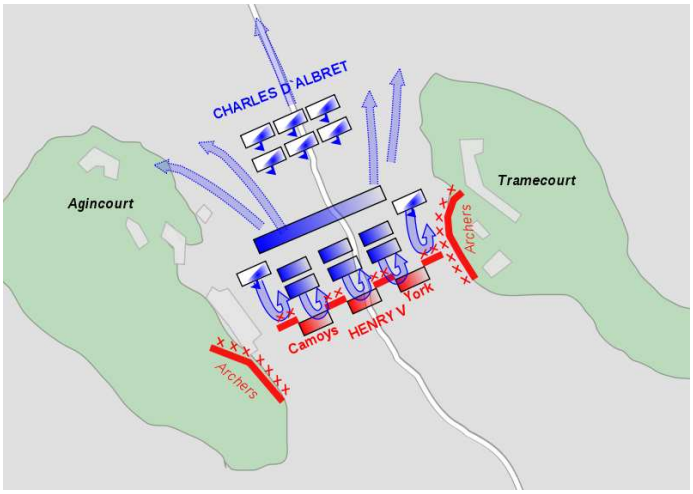
Medieval Military Strategies and Tactics

Military strategy and tactics went through a significant transformation during the Late Middle Ages, shifting from a cavalry-dominated battlefield to one that demanded a diverse organization of different types of soldiers that relieved each others’ weaknesses. It was also during this era that siege technology experienced a sudden boom, completely changing the face of siege warfare, and invasion campaigns in general. As technological and strategic innovations become available, it became easier to exploit the weaknesses of any single military unit, eliminating any form of a be-all and end-all weapon or unit.

Prior to the Late Middle Ages, the knight was the single most dominant force on the battlefield. A nation state with a relatively small number of skilled and well armed knights on horseback was able to hold its own on the battlefield. As the usage of the pikes in tight lines evolved, cavalry charges become less effective and more situational. With lines of pikemen protecting them, archers and other ranged infantry become more effective and more common on the battlefield. The use of deployed defenses for archer lines against cavalry charges, such as the use of pointed wooden stakes driven into the ground at an angle first used by the Ottoman Empire at the Battle of Nicopolis (1398), were very successful to stop cavalry charges.

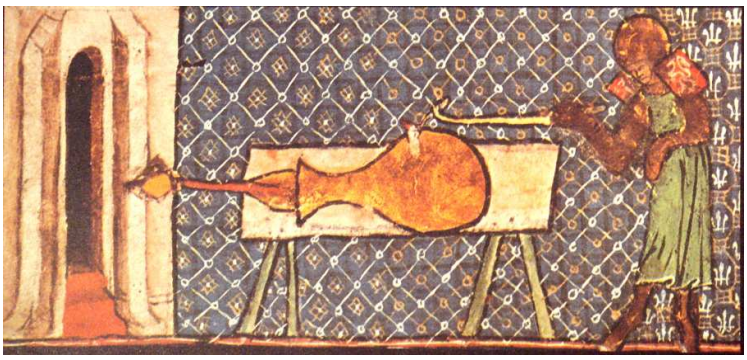
By the end of the Late Middle Ages, archers and crossbowmen had become the most numerous soldiers on the battlefield. This is especially true in the northern nation-states, such

as England. During the Battle of Agincourt (1415), it is estimated that 5/6 of the English soldiers were longbowmen (Keegan, 90-91). Despite going up against a larger, better equipped and fresher French army, the English were able to gain a decisive victory thanks to their strategic deployment of soldiers and fortifications according to the terrain. The bottleneck allowed for the smaller number of English soldiers to take on the larger French army and even flank them with the archers.



Because the strengths and weaknesses of each type of unit were clearly exploitable, armies consisted of different arms and formations. Often, a marching army consisted of cavalry, pikemen, archers, men-at-arms and siege units. This diversification of the military created a system that differed significantly from before. Instead of small units of heavily equipped knights, armies now consisted of large units of much more lightly armed soldiers, with only a few heavy cavalry and foot soldiers.

"It is a commonplace among historians of medieval warfare that battle was rarely engaged – as Vegetius had stated, battle should be avoided as far as possible because it involved too many risks and its result was final" (Nicholson, 113). Often times, armies would wage wars of attrition and constantly harass the enemy by burning crops and buildings. Wars of attrition worked simply based on the assumption that the enemy will wither from exhaustion, disease and starvation. Often, heavily fortified forts or cities would be passed over by attacking armies because a siege would simply take too long. The other advantage of destroying supplies was demoralizing the enemy, both in terms of the opposing army as well as the people of that country. Even when fortresses were taken, it was generally assumed that strong relief forces would arrive shortly, so the besiegers would simply capture, loot, destroy and leave. But despite this, sieges were significantly more commonplace than regular battles. "Sieges dominated medieval warfare in a way that battles never did. That great warrior Richard I fought no more than two or three battles in his entire career, but he was constantly involved in siege warfare" (Prestwich, 281).



Earliest picture of a European cannon, 1326 http://en.wikipedia.org/wiki/Cannon

By the end of the Late Middle Ages, siege weaponry had already become commonplace in the battlefield. Eventually, cannons accompanied invading armies and were able to take down all but the most technologically up to date fortifications with relative ease. Prior to that, cannons were often so big that they were easier to cast on the spot, instead of being dragged there. An example of this is the besieging of Constantinople in 1453 (McNeill, 87). Of course, in order to make sure these cannons were effective in their sieges, there had to be well organized formations to protect them from any defending troops. Up to the end of the Late Middle Ages, siege-proof fortification technology had not yet caught up to cannon technology and the tides of battle greatly favored the besieger.

Because of the needs of the larger armies that were required for warfare in the Late Middle Ages, strategies had to revolve around such requirements. Large armies had to be paid and fed. Making sure that the soldiers were all paid was a huge strain on the government, but if they didn't, they risked the soldiers pillaging the region that they were marching through, which could cause hostilities with the locals, even if they were allies or even their own country. Keeping the soldiers fed was also a problem. Foraging for food also caused hostilities with the locals of the area, and sometimes there simply just wasn't enough food to go around (Prestwich, 248-256). Of course the plans for a campaign had to depend upon the speed at which the soldiers could march, as well as the time it took to transport any wagons of supplies or siege weapons that they may have with them.

The development of military strategies and tactics gained speed during the Late Middle Ages, in part due to changes in technology and the implications of those technologies. And with these changes in military strategies and tactics, social and economic changes also came about as a result. As the structure of the military changed, so did the impact that it had on the lives of the people, from the nobility to the common folk.

Economic and Political Implications of Warfare in Medieval Europe

During the Late Middle Ages, warfare, or the risk thereof, dominated the lives of every citizen throughout Europe. A large majority of the expenditures of the governments of the era was for military purposes: development, equipment, defenses and the basic upkeep costs of soldiers. Besides that, despite the decline of the effectiveness of the knight on the battlefield, the tradition of chivalry still remained within society as a vital part of the social structure. There was little differentiation between the military and government; many political figures had direct association with the military and many military leaders were also from the ruling class.

Military spending became a large part of medieval society. During the Late Middle Ages, siege technology advanced at a rapid pace, but not without serious economic implications. The cost to research and develop new siege weaponry was enough to keep all but the largest sovereigns out of the newly emerging arms race, with those unable to keep up degenerating to pawns for those who could. The invention of mobile siege guns by the French and Burgundians between 1465 and 1477 pushed the large nations of Europe even further ahead of the rest of the world in power (McNeill, 89). The amount of resources required to develop these siege weapons created a surging demand for mines, providing the large empires that encompassed various mining regions with a significant advantage over their competitors. Besides the cost associated with the siege weapons themselves, the fear of them also had a powerful impact upon the economies of the medieval world. Because new advancements in siege technology require advancements in fortification technology, even the least aggressive of rulers must pump exorbitant amounts of resources into military spending.

Beyond spending money on technology and equipment, the upkeep costs of the larger armies of the era also presented a problem to most governments. Most soldiers were being recruited from the working class, depending upon payments from the government in order to survive. In addition to the salary provided by the government, plundering for sustenance was the norm for soldiers (Prestwich, 126). Often, rulers were unable to raise enough money from taxes to pay their soldiers and had to resort to borrowing money. Sometimes this wasn't enough and the armies had to resort to plundering and living directly off the country in which they were operating (McNeill, 105). The economic implication of the large standing armies affected everyone, whether in the form of heavy taxes or heavy plundering. But besides having to be paid, soldiers also had to be fed. The burden of feeding a standing army stationed in an area was disastrous to some regions, where there was barely enough food to

feed the normal inhabitants. In addition, the equipment used by the men generally was not provided by the government, but left to the men themselves and their local communities (Prestwich, 133-134).

In addition to having to shoulder the burden of maintaining the standing army, citizens were also obligated to provide the manpower for said armies. While this isn't entirely true for all soldiers, with mercenaries providing a large part of the military force, sometimes conscription was necessary. During wartime, anyone could be called on and expected to help the war effort. Able-bodied men were expected to provide their strength in protecting their towns and cities. The field of engineering fortresses and siege weaponry arose from military needs (Nicholson, 166).

Common infantry were often recruited based on the region they were from in sovereignties that were large enough to encompass multiple regions. Soldiers were generally assumed to provide their own weapons and know how to use it. In the English army, Cheshire men were often called upon because of the amount of wars that had previously occurred in the region. Wales was also a prime location to recruit soldiers, as they were known to have effective bowmen and spearmen (Prestwich, 127).

Historically, the social elite have always played an important role in the military. The knightly class from the feudal era never really died out even during the Late Middle Ages, and nor did their chivalric traditions. Other than being much better trained and equipped than standard soldiers, the military elite were also paid significantly more. "In terms of pay, a banneret received twice as much as a knight, who in turn received twice as much as a squire or sergeant. Rank did not reflect military ability or experience alone; it was also an indication of social status" (Prestwich, 13).

But nobility and honor wasn't entirely hereditary; through military achievements, fame and wealth could be won. If a man performed a notable deed in battle, he could expect a reward for his actions. While the son of a knight was generally assumed to receive his father's rank, it wasn't always the case. Also, not all knights were of nobility; common citizens were sometimes able to become knights if they could somehow afford the equipment and gain enough recognition on the battlefield (Prestwich, 13-18).

Despite this, social structure was relatively static, with large economic gaps built into the system. The average citizen was living under conditions that were below the poverty line. Government policies usually favored the rich as well, such as the Statute of Labourers (1351), enacted by King Edward III in response to the labor shortage of England, setting the maximum wage to those paid before the Black Death. But besides laws passed simply to

maintain the balance of power, constant warfare created a need for heavy taxation. By 1377, a third poll tax was enforced in England to pay for the Hundred Years War. But the peasants didn't just take their mistreatment passively. In 1381, one of the most well known and extreme insurrections in English history, the Peasants' Revolt, showed that the peasants had power in society. Even though it was a failure, it began a movement for radical social change.

The notion of chivalry dominated society, in both the military and civilian context. Chivalry was widely recognized as the legal standards of warfare; alongside religious doctrine, it acted as one of the most important factor in declaring a war as just. Literary works of the era emphasized chivalry. It was shameful to attack wounded or unarmed opponents; it was considered better to die manly than to flee shamefully; the rape and slaughter of civilians in captured cities was deeply looked down upon (Prestwich, 230). Romantic tales about courageous and chivalrous knights dominated the literary works of the era. But with the increased numbers of common soldiers, the elite often blamed them for any atrocities that may occur. Of course atrocities committed by the knights still happened and chivalric rules were not always followed when life and death was on the line, but the idealization of the way high class warriors were supposed to behave still persisted within folk tale and romantic novels of heroic battles.

During this time, rulers often led their armies into the battlefield, leaving little separation between the government and the military. For many sovereigns, they were not states with armies, but instead armies with states. Much of the leadership within armies was also part of the ruling class. During the Battle of Agincourt (1415), King Henry V led the English army himself into battle with the French. The French army consisted almost exclusively of men-at-arms, of which many were noblemen (Keegan, 78-86). The class distinction was apparent in the way prisoners of war were treated. The richest warriors could be defeated in battle multiple times, but would usually be spared and ransomed back. Common soldiers, on the other hand, weren't as lucky and were usually slaughtered. Depending on the situation of the winning army, there was usually a minimum affluence for a prisoner for him to be worth ransoming.

Warfare and the military in general, dominated society and the lives of every citizen during the Middle Ages. The nobility and ruling class have always played an important role in the military, but as armies moved towards a more organized and inclusive structure, common citizens became more involved and more directly affected by the military. But in the greater political picture, as more military power shifted away from the ruling class, in a society dominated by the military, the common people began to gain more of a say in

government. As the Late Middle Ages transitions into the Early Modern Era, the once defenseless peasants are now more capable of asserting themselves, eventually gaining enough power to get a say within government.

An overview of the historical context of war in Europe between 1500 and 1650.

By Jotham Kildea

The evolution of military organization and the growth of military professionalism.

The era of warfare leading out of the Middle Ages from 1500 until the mid 1600's saw many gradual changes. These changes evolved war in Europe from the traditional skirmishes and knightly battles of the dark ages into tactical and comprehensive warfare waged by powerful leaders.

This timeframe was particularly important to shaping the professionalism and organization of European militaries, and the influences came from many directions. First of all was the rigorous training and drills that became popular for the general infantry to ensure they were ready for combat. The period saw a constriction in the diversity on the battlefield as pikemen became the favored force on the field for the early sixteenth century. Also, it became apparent that keeping current with tactics and technology was vital in any war. Therefore, the ideals of Chivalry – once the prime motivator of heroism in battle – were quickly falling to the sidelines. The idea of augmenting an army with large numbers of mercenary soldiers, however, was popular with many rulers and constituted a vital part of warfare. Who to recruit to fill officer positions also changed over time, as did how these officers chose to organize their subordinates to be most effective. Compositions of regular army forces changed too, between the decision of favoring filling ranks with untrained novices instead of experienced and competent soldiers. The advantage found in these novices was that they could easily be trained for war through standard drills.

Training drills for soldiers were an especially important part of the rise of military professionalism. These drills were best utilized when part of a continuing training program for soldiers, which would reinforce their skills so that they would be ready for battle (McNeill 140). This practice also brought together the individual soldiers in the unit, making them more professional and less likely to fault. One of the best examples of drills having an impact on armies was in the preparedness and usefulness of pikemen.

Pikemen experienced lasting successes in battles, and due to this grew in dominance of the battlefield so that they were the primary weapon utilized. Though the pikemen would

later be combined with arquebusiers in the form of firearms with bayonets, they did affect one lasting impact on the course of warfare for Europe. Their popularity, along with drills to train them, helped tactics evolve as each unit could be thought of as identical to the next and be expected to perform in any way needed. For this to be successful the soldiers had to be well drilled in maneuvering and fighting in groups.

This expectation of unity in a unit of soldiers ran into some difficulty with the predominance of arquebuses. The tradeoff for this cohesion of forces is that in order for any army to upgrade its weaponry when a new technology arrives, a sizeable amount must be spent to finance the upgrade for every soldier (McNiell 141). To not upgrade everyone equally would cause disparity in the abilities of units and ruin the cohesion and lead to weak spots in the army. This was at odds with the reality of the situation at the time, which was that in order for an army to be successful it had to keep up with the technological and strategic trends of the time.

It was just as important to keep soldiers routinely drilled as it was to keep them modern with their technology. There is little doubt that much changed in the organization of the military from 1500 to 1650, as it went from a war concerned with a wide variety of arms and specialists to one of little diversity in the type of armament, which was typically gunpowder based (McNeill 141). Soon after the beginning of the sixteenth century, the pikemen had become the soldiers of choice for battle due to their effectiveness against the heavy cavalry. When in sizeable groups and marching in perfect unison they became formidable opponents with their wall of pikes dissuading enemies. Conversely, knights were on the decline on the battlefield having once been the formidable opponent of the field.

By the sixteenth century, knights had already passed their heyday of usefulness on the battlefield. Many people closely associate Europe in Medieval and Renaissance times with the stereotyped image of the chivalrous knight who fought valiantly in battle. While this may have been the case in the earlier years, by 1500 the number of knights in warfare dropped sharply. Where the fully-armored knight was once the indestructible and vital soldier on the battlefield, in the sixteenth-century he was instead obsolete in comparison to the well-drilled pikemen, light cavalry and arquebusiers (Porter 152). Much of the importance of knighthood was restricted to the social and cultural fields, and had little presence in battle by the end of the middle ages (Porter 152). This changed the landscape of military professionalism, as the ranks were occupied by the average civilian, rather than having wealthy nobility receive special treatment and dominance in battle. Instead, the focus shifted to hiring professional soldiers to fight on behalf of the nobility.

Mercenaries were an especially vital element in battles at the time. They were able to take military professionalism to a new level, as the captains of the unit had absolute control over the military behavior. This often led to many units developing their own strong culture and society (Koch 193). Such an example is the *Landsknecht*, who were a large mercenary force with German foundations. These soldiers were required to swear to the *Artikelbrief*, which was a constitution of sorts that outlined their duties and responsibilities, which were followed under punishment from a court-martial system administered by the unit the soldier was with (Koch 193).

In many ways it was the hierarchy of officers that gave the *Landsknecht* their strength. The *Landsknecht* also had a strong hierarchy with lieutenants, sergeants, ensigns, corporals and captains. This chain of command meant that the soldiers within the unit were able to have an interest in how the battle was to be fought via a spokesperson (Koch 193). This aided the professionalism of the soldiers, as once a colonel received a contract for their services captains were chosen and down the line officers would be given charge of their respective subordinates. This led to a large selection of units and armies of mercenaries that a leader could contract to fight for his cause, and many would draw on specialists from differing regions of Europe (MacMahon 198).

Ultimately, it depended upon who was in charge of the army and the experience that they possessed. During this timeframe the decision of who should be in a position of power in the military was not at all clear. Traditional practice in the military of the Middle Ages was to assume that officer posts would be granted to those of nobility and higher social status. Though this practice continued through the Renaissance and after, it began to decline in favor of soldiers with experience (MacMahon 184). There was some logic and rationale to this practice, as the gentry were often in positions of power in civilian life where they exhibited leadership and had influence over many people (MacMahon 187). At the same time though, leaders could also have little training or experience, and simply hold their position due to their status. While this may have been the norm, there certainly were more and more cases where leaders were chosen based on merit. King Henry of England would draw extensively from the ranks of soldiers and officers stationed on the borders of the nation, where they had already gained experience and proved their skills. This dilemma of whether to hire based on social status versus merit carried over into the general infantry realm as well, with questions of who would be best suited to serve in the infantry.

Europe was at this time undergoing a revolution in thought over who to have serve in their armies. Before the sixteenth-century many military leaders assumed, and reasonably so,

that the best army would naturally be the one which picks out the most skilled and experienced soldiers to fight (Hall 234). Nonetheless, the desired soldier became the average civilian that could be trained and drilled as necessary to fit the needs of the army. The reasoning is best described by historian Bert Hall as:

> "Earlier rulers recruited men who already possessed the skills needed to conduct war. For his renewal of the French Wars, Henry V sought men who had spent their youth learning to shoot a longbow. The arts that were needed to take part in combat were taught as part of civilian life. Under the right circumstances these skills had a certain market value. In the sixteenth century, by contrast, rulers preparing for war sought to recruit many men with the lowest levels of skill and the poorest prospects for work in the civilian economy to serve with the duke of Alba in the Netherlands. The difference, of course, was that Philip's captains could do what Henry's knights could not – drill any recruit in the ways of handling an arquebus or a pike and make him into a competent soldier (Hall 234)."

This demonstrates the changing course of European warfare; as warfare became more standardized in training, tactics, arms and armour, the prospect of using novices who could be trained as needed became advantageous. This all was greatly different from the mentality that European armies had at the start of the sixteenth century.

Europe entered the sixteenth century a very different world than it would become over the following 150 years. It started as a region desperately striving for the standards set forth by the chivalry and feudalism of the past and undergoing rapid changes as nations and powers constantly looked for the newest technology and tactics. It ended in a very different state, with nations of powerful armies outfitted with predominantly gunpowder weapons. These changes revolved first and foremost around the average soldier, and how he perceived and experienced war, as well as how technologies increasingly proved the importance of military professionalism.

Technological development and its effects on warfare.

The period of warfare in Europe from 1500 to 1650 is one that was heavily influenced by technological advances. At times these advances led to decisive changes in the landscape of war, and at other times they led to stagnation of progress where little changed for an expanse of time. Early in the sixteenth century, the primary arms of infantry troops were pikes and arquebuses, old and new technology respectively. Over the course of the following century they would be bombarded by innovations that would at first improve their effectiveness and use, but ultimately lead to them becoming obsolete. One of the most

significant innovations was the development of the wheel-lock pistol. This technology brought about the final decline in the use of heavy cavalry in battle, as well as shifting favor in infantry to the firearm over the pike. With this innovation, however, came a transition to siege warfare that would remain dominant long after 1650. This period demonstrated the changing face of fortification technology, as well as the technology of the artillery used within them. Ultimately, the stalemate resulting from the slowing of technological process in warfare led to the growth of military sizes in almost all nations of Europe. Even though the tactics and methods by which war was waged had changed dramatically due to technological change, by the end of this time period in 1650 the makeup of an army, a comingling of pikes and firearms, remained essentially the same as it was in the beginning of the 1500's.

By the beginning of the sixteenth century, the pike had become the weapon of choice to equip soldiers. This is impressive because the pike was an example of very old technology in a time where tactics in warfare were constantly under change to gain the advantage and to adapt to new technology. Pikes had been present in war since antiquity, but they received special consideration in the sixteenth century and in fact rose to dominate the field of battle. While few technical developments could improve on such a simple weapon, there were instances where the tactics and practice of use of the pike was improved. Texts were developed that clearly and specifically defined how to use the pike when marching, fighting or preparing to fight (McNiell 128). Also, the first military academy in Europe was opened in 1619 to train officers how to train soldiers in the use of their weapons. These changes are evidence of technological change in their own right, as they were vital to making the pike a viable complement to the growing number of soldiers equipped with arquebuses. It is in this instance where the pikes proved their greatest technological merit, because until the 1550's they were the best defense available against heavy cavalry that would otherwise pose a grave threat to the infantry soldier with an arquebus (Hall 190).

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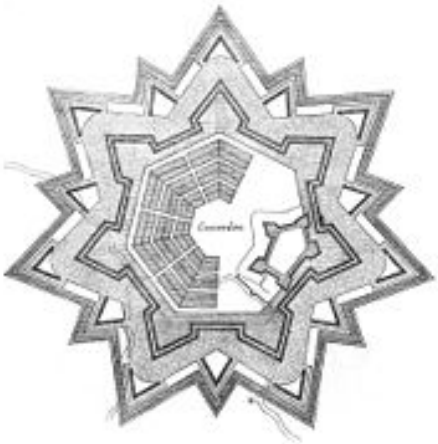
The arquebus had been around since the fifteenth century, but was still limited in its use by the 1500's. Though at first glance the arquebus may resemble modern firearms, it was very different in use and effectiveness. What distinguishes an arquebus from a musket or its predecessor the hand-cannon is that unlike the hand-cannon, it has a matchlock firing mechanism, and was often lighter than the musket. Modern testing has shown that the average arquebus was not only inaccurate (missing a target nearly one quarter of the time at less than ten meters), but also not very lethal (often failing to penetrate an average armor breastplate, merely denting it) (Hall 145). Due to its drawbacks, an arquebus soldier would have been defenseless if the target of a heavy cavalry charge (Hall 199). In order to compensate for this technological shortcoming, units of arquebus soldiers were accompanied by a great deal of pikemen who stood a better chance of confronting the cavalry. This remained the situation until a new technology, the wheel-lock pistol, came into use and would lead to light cavalry equipped with wheel-lock pistols being favored in battle over heavy cavalry (Hall 199). Once this shift began, the threat posed by heavy cavalry charges was not as great, so arquebusiers could accompany pikemen in greater ratios.

The wheel lock was a new mechanism in the sixteenth century that made the arquebus much more effective than it had been before. It was an improvement over the previous matchlock firearm, and was one that allowed the weapon to be much more powerful and lethal, especially at close range (Hall 193). The technology for the wheel lock had likely been around since the beginning of the sixteenth century, but due to its complex nature and the need for such precision in its manufacture, it was confined to being constructed in the most advanced and capable cities of the time such as Nuremberg and Milan (Hall 191). It wasn't until the 1540's and 1550's that the wheel lock truly became effectively used in warfare, but when they did arrive in numbers as a complement to the lighter arquebus, it quickly brought about an end to the use of heavy cavalry charges in battle (Hall 190). Pistoliers equipped with wheel lock pistols proved enormously effective instead of heavy cavalry, and soon after this was discovered the use of heavy cavalry dropped precipitously. A second effect of this new technology was that once the knightly cavalry had been removed as

a threat, the necessity of high numbers of pikemen on the battlefield also disappeared. As a result, the ratio of pikes to arquebuses began to decline throughout Europe, in conjunction with the increasing strength of the average arquebus (Hall 199). The drop in cavalry use and the dominance of the arquebus together resulted in the style of warfare in Europe returning to a very defensive one. In this new world of defensive combat, most wars were a matter of developing strong fortifications against enemies, or conversely laying siege to such a fortification for some time.

Fortifications and the sieges laid around them were certainly not a new concept in Europe in the late sixteenth century, but when many nations began to revert to them when at war they were utilized in an entirely new way. By the sixteenth century, artillery had the capacity to destroy most fortifications built on the field of battle when used properly, and so the trend was a shift towards stronger, more permanent fortifications that could withstand the damage dealt by the new gunpowder-based artillery (Hall 169). An example of the new technology in fortifications was the *trace italienne,* a structure of many walls and complex polygons (wikipedia.org). It was specifically designed to counter the danger of cannon and artillery fire, with numerous sloped walls and made of brick and earth. Also, its novel design created many locations along the perimeter that could cover one another in the event of attack, and limited the amount of space that could not be covered from attack (wikipedia.org). An example of a piece of technology that benefited as a result of these fortifications is the heavy, or "Spanish", musket. This particular firearm was similar in design to the standard arquebus, but was considerably heavier and fired a more powerful shot. As a result of its weight, it was difficult to carry on foot, but found some function as a defensive weapon that could be confined to guarding the walls of such a fortification (Hall 178). All of this made the forts of the late sixteenth and seventeenth centuries extremely difficult to topple, and many armies shifted their tactics to instead laying siege to the entire fort in the hopes of pressuring the defenders into surrender. Consequently, many nations began to substantially increase the size of their military force going into the seventeenth century, in order to better lay siege to the enemy (Hall 204).



Top-down example of a *trace italienne* (wikipedia.org)

One indirect effect of technology upon warfare in Europe was that many nations were driven to increase their military sizes to meet the new nature of war. Many feel that this was because many soldiers were necessary to lay siege to the enemy, and though it did not lead to many open conflicts, it did push numbers higher (Hall 204). One such example is the Spanish Army, which saw its troops totaling sixty to sixty-five thousand by the end of the sixteenth century. This trend continued, and the numbers peaked in the 1630's around 300,000 troops (Hall 209). This event can be seen in many other nations in Europe, and dictated the course of battle in the seventeenth century. Ultimately, the expansion of armies is a clear effect that technology had on militaries in Europe during the sixteenth and seventeenth centuries.

There is little doubt that technological progress was the primer to the sweeping changes seen in warfare in Europe from 1500 through 1650. It was technology that carried war from decisive battles between pikemen, arquebusiers and heavy cavalry to long, inconclusive sieges that stagnated progress in battle and the arrival of new technologies. These changes are summed up in the explanation by historian Bert Hall:

> "If we make comparisons over the long term, the fifteenth and early sixteenth centuries were the age of rapid and radical innovation; the later sixteenth, seventeenth, and early eighteenth centuries were a time when technology changed only marginally. Commanders in those times had to live within the tactical and strategic limits forged by the technologies of an earlier day (Hall 216)."

Renaissance military strategies and tactics

The Renaissance as a whole and in particular the period from 1500 to 1650 can be seen as an explosion of ideas and new ways of thought. This was certainly the case on the military front, as leaders throughout Europe refined and renewed their tactics in battle. Different strategies would at times prove more effective than others, and leaders strove to utilize the best tactic that could ensure victory. While one particular tactic may work for one nation, it would almost never work for all, and often different styles of warfare would be waged depending on the nations involved.

The first tactical decision for a leader of the period to make was whether to be offensive or defensive. Each had its own advantages and disadvantages, and were carried out differently by different nations. Often associated with this decision was the tactics associated with artillery pieces, which were vital both in offense and defense. Particularly when on the offensive, there was a wide range of tactics used in battle depending on which types of troops were involved. Common pairings were between cavalry and infantry and infantry and other

infantry. The tactics surrounding both evolved over time in the Renaissance. These tactics were especially influenced by the differing advantages and disadvantages of pikes and arquebuses that the standard infantry would be equipped with. Altogether, these tactical decisions would be the result of a leader's decision whether to go on the offensive or defensive in warfare.

During the Renaissance many leaders sought a largely defensive tactic. The growing trend leading into 1650 was one of defense and fortification in preference to open conflict. The iconic example of this tactic was the *trace italienne*, a large fortification particularly designed with sloped brick walls and no blind spots to counter the threat of artillery. These structures became the deciding factor in a region whether war would be waged openly or be reduced to a lengthy siege (Parker 24). Despite this, it was more often the case that warfare would increasingly be based around laying siege to a fort in the hopes of starving them into surrender. To accomplish this, however, the besieging army needed to go on the defensive themselves; they would erect two rings of walls around the city both to keep the fort's occupants in and to keep other enemies out. An example of this tactic was in 1629 when the Dutch surrounded Hertogenbosch in this manner with up to forty kilometers of fortifications (Parker 13).

A particular example of the application of a largely defensive mode was the strategy known as the "Spanish school". This school of thought entailed a nation maintaining a very large force of soldiers that would predominantly be on the defensive, in fortifications such as the *trace italienne* (Lynn 40). What made this effective was that any aggressor would be bogged down in a lengthy siege, until the point where their army was weakened so that they could be defeated easily. The downside was that this technique quickly became very expensive even for the largest of nations. Maintaining so many fortifications in an empire required a large number of soldiers to garrison them, who all had to be paid and supplied. This became an increasing problem for many nations, and especially for the Spanish Army of Flanders, who in 1639 maintained 208 garrisons. The soldiers maintaining these fortifications accounted for nearly half of their entire army of 77000 (Parker 40). This further promoted a defensive strategy, as nations tied up so much of their military spending in defense that it became the greatest part of their expense (Parker 39).

On the other hand, some nations took on a traditional warfare technique that promoted open combat. France lies within this category, and attempted to maintain an offensive strategy in a time where most all nations, as well as then-leader Henry IV's own advisors, felt that it was a poor decision (Lynn 42). This was confirmed in France's offensive against Spain

in the Netherlands at the end of the sixteenth century, which was a major failure for France (Lynn 42). While France's tactics may have suited it poorly, Poland found success with the tactics they had maintained since the end of the Middle Ages. Poland would use large numbers of cavalry in their armies in the sixteenth century, their armies would have up to ten horsemen to every foot soldier, and their presence was effective because their main enemies were the Tartars and Turks, who could be defeated by cavalry (Parker 37). This changed, however, in 1621 when Poland fell victim to the attacks of Swedes. Poland had few fortifications, and found their focus on open conflict to be poorly matched to the Swedish armies (Parker 37). Another way that armies looked to the offensive to be victorious was instead to work towards quick victories that would not drag on into long, costly sieges. Therefore many armies would raise the numbers in their ranks simply for the purpose of going on the offense, and not plan on maintaining these numbers for the long term.

Artillery grew more and more important to the tactics of combat from 1500 to 1650. Throughout the era the size of artillery shot was growing, as a larger shot would carry greater momentum, travel further and faster, and do more damage than a smaller shot would. When deployed on the battlefield, artillery crews would primarily be concerned with finding a target that was 'deep', meaning that there were many enemy soldiers in a row that could be struck by one shot (Hall 151). Accuracy was not as great a concern, as even a shot that drifted off course was likely to still make contact with an enemy soldier. Also, a low trajectory to the shot was favored because it allowed the shot to bounce off of the ground, hoping to strike multiple soldiers. If it was fired high into the air, it would instead bury itself into the ground and be ineffective (Hall 151).

On the other hand, artillery used by both sides during a siege was utilized very differently. Where in open battle an artillery piece could fire up to two rounds per minute, during a siege where the concern was accuracy, the rate was closer to twelve rounds per hour (Hall 153). The primary concern of the besiegers was to breach the fortification so that it could be accessed, and Vauban (a tactician of the time) developed a series of steps for how to use artillery to breach walls. This tactic was not fast, and could often require thousands of rounds to penetrate a wall, and so attackers would often use several artillery pieces concentrated on one section of wall (Hall 154). The defending army would of course be retaliating with their own artillery and soldiers armed with rifled muskets that would target the besiegers' artillery, forcing them to dig extensive zigzag trenches to inch closer under protection to their target (Hall 155). These slow and arduous tactics were very different from those of the open battlefield, where the use of cavalry could be pivotal.

Cavalry enjoyed successes in the early part of the sixteenth century, but found themselves increasingly at a disadvantage into the seventeenth century. The advantage they held was that they were effective when used to charge the enemy, being able to add a shock value to their attack that was effective against infantry. As stated earlier, they were used effectively for some time in Poland, and were also popular in Russian armies of the same time (Parker 38). Their standard tactic of charging the opponent was countered by the use of pikes and later of wheel-lock pistols which proved to be effective deterrents to cavalry. The same wheel-lock pistols were found to be useful to the lighter cavalry, who would often carry three or more of them into conflict. The tactic involved riding very close to the target, discharging all of the rounds, and retreating in order to reload all of the pistols (Hall 193).

Conflicts between two similar infantry forces were the standard in conflict in the sixteenth and seventeenth centuries. Early in the sixteenth century, the large majority of infantry soldiers carried pikes, and when two forces of similar size fought, a stalemate often ensued as neither side could gain the advantage. To deal with this, a tactic used was for a small group of soldiers carrying very large swords to charge the enemy, hoping to cut a hole into their ranks which would create a weakness (Koch 198). Later on this tactic was not necessary as the increasing number of soldiers with firearms comingled with pikes diminished the problem. During the 1500's the firearm was utilized at an increasing rate, and it began to make the broadsword, crossbows, and longbows obsolete, as it could deliver a greater effect at a distance before close-combat ensued (Parker 17). By the 1650's, many units of soldiers contained firearms and pikes in a three or four to one ratio, compared to in the early sixteenth century where the ratio was reversed (Parker 18).

Tactics were changing during the Renaissance, and greatly influenced war as a whole. The period experienced a trend towards defense, with lengthy sieges by sizeable armies being undertaken instead of outright combat. This led to tactics both to defend and assault during a siege, as well as the continued evolution of cavalry and infantry in combat. Along with these changes, though, came an even greater influence as a result of the economic and political situations facing nations of Europe in the Renaissance.

Economic and political implications of warfare in early modern Europe

The early modern era was a difficult time for many European powers, both politically and economically. These powers found increasing difficulty in maintaining a large military

presence as the cost of doing so began to skyrocket. At the same time, the means to raise the funds each had their own drawbacks. A popular method was to simply borrow the money, which entailed nations accruing substantial debt in the course of their military campaigns. Alternatively, a nation could rely on taxes to cover the cost of an army, a move that would be politically unpopular and was met with substantial resistance. Lastly a leader had the choice of simply minting more currency to cover the difference. This, coupled with the already rampant economic woes facing the lower class, could be devastating to a population. During all of this the life of the average civilian was being changed drastically by falling wages and a tendency towards the early fundamentals of industrialization.

The cost of maintaining a powerful military grew sharply in the sixteenth and seventeenth centuries. By the 1650's, for example, England is estimated to have spent up to 90% of its total government money on the military (Parker 62). One of the significant factors that contributed to this growing expenditure was the growth in the numbers of soldiers. This is best exemplified by the armies of Spain. In the 1550's their strength was already at 150,000 soldiers, but this grew to 200,000 in the 1590's and then 300,000 in the 1630's. However, the actual cost grew much more rapidly than this, as is demonstrated by the figures in Table 1 for cost of maintaining the Spanish army from the 1550's through the 1590's (McNeill 110). One reason for this was that there was far more to paying for an army than simply paying wages. Numerous other expenditures such as pikes, musket, ammunition, flags, food, and scouring rods needed to be provided for soldiers. Also, there was the cost of transporting the soldiers, either by land or by sea, in which case they would need ships with their own crew and needs to be paid for (Tallett 170). Along with this came the changing face of war into one of attrition, as Giovanni Botero wrote in 1605: "[Nowadays] war is dragged out for as long as possible, and the object is not to smash but to tire; not to defeat but to wear down"(Parker 61). This meant that most wars would need to stretch on for an extended period of time, usually during a prolonged siege, using up large sums of money to maintain the army.

Years	**Expense (million ducats)**
Before 1556	<2
1560's	4.5
1570's	8
1590's	13

Table 1 Yearly expenses to maintain the Spanish Army (McNeill 110)

The construction of fortifications was just as burdensome to a nation as maintaining large armies. The best choice for nations when it came to defense was to construct a *trace italienne*, but they were extremely expensive, and could only be afforded by the wealthier nations (McNeill 90). Modernizing a single fortification in England in the later sixteenth

century, for example, cost around £130,000, which was nearly half of the total spending for England in a year. Despite the expense, historian Frank Tallett has argued that it would have been less expensive for a nation to put forth the one-time amount in order to construct a strong fortification and then spend less to garrison it than to maintain a large standing army (Tallett 171). In either case, however, the cost would have been staggering, and therefore leaders looked to methods to accumulate the money necessary for such expenditures.

Many leaders found it convenient to simply borrow the money needed for their armies. One of the popular ways to do so was for a nation to sell futures in tax revenues and incomes. This allowed a government to get the money needed up front in a lump sum, but it left the nation with a problem later when they needed more money to maintain their army and had little or no tax revenue to cover it because they have already sold it off (McNeill 105). This left the nation in a difficult position, as if they failed to pay an army it would quickly become undependable and likely to quit (McNeill 105). Another sale that a nation could make was particularly exemplified by Spain and its sale of *asientos*. *Asientos* were futures in American mining profits, and were used extensively by Phillip II to fund his military might. But as with any investment, the uncertainty of revenues further in the future meant that the interest on any loan would be higher, and therefore less beneficial to a nation. Because of this, Spain soon had to issue a 'decree of bankruptcy', which dictated that these *asientos* be converted into *juros*, which are long-term bonds that were easier for the nation to afford (Hall 221). This practice happened numerous times in Spain's history, each time pushing it further into debt that it didn't have the ability to repay (Parker 63). This of course angered bankers who had loaned the money, and many nations had difficulty with convincing their creditors that they would be able to make a profit from their wars that could pay off their debts (McNeill 108).

Not wanting to rely solely on creditors to fund a war, leaders also looked to their own population. By maintaining order and obedience in their populace through defending it with a military, a nation could improve its own tax base with increased prosperity, creating a positive feedback loop (McNeill 117). However, during the sixteenth and seventeenth centuries the average citizen in most countries was slipping into poverty. Some census estimates during that time estimated that as much as half of the population of some cities was in dire poverty (Hall 220). This meant that the prospect of having to pay taxes became unfeasible for many, and would often lead to revolt in the early modern era, particularly during times of hardship such as a failed crop season or drops in wages (Tallett 180). This in turn created a negative spiral, in which the abundance of revolts called for increased military

presence to quell it. This of course cost money, and could lead to further taxation to help pay for it (Hall 224).

Lastly, a leader might chose to fund a war by directly minting money. Because they had control of the minting of currency, leaders had the choice to simply mint what they needed. For example, from 1621 to 1626 Spain managed to gain 2.6 million ducats a year by converting to a copper-based currency (Tallett 174). This action in turn devalued the currency, which was extremely damaging to the lower class of Europe. To make matters worse, the lower class were already dealing with strong inflation due to the flood of silver and other metals from Spanish mines in the Americas (Hall 218).

Years	**Wage**
1451-1500	143.5
1501-1550	122.4
1551-1600	83.0
1601-1650	48.3

Table 2 (Hall 220)

The early modern era was an especially difficult one for many of the average people of Europe. Starting at the beginning of the 1500's, a trend began of precipitous declines in real wages for most workers. For example, the real wages of an English carpenter shown in Table 2 demonstrates the severity of the decline (Hall 220). This decline meant that an increasing number of citizens looked to the military in the hopes of making enough to survive and escape their destitution (Parker 47). The upside of this influx of unskilled laborers into the military was that upon leaving the military, they were adept at following orders and accustomed to a disciplined life. These were precisely the traits that early factories would look for in employees, as they fit well to an environment where jobs could be taught easily and discipline was important (Hall 234). This allowed military experience to contribute to the growth of the industrial revolution leading out of the 1650's.

The hardships experienced by nations and individuals alike in Europe by no means ended in 1650. They continued to plague nations for centuries afterward, just as they had been a problem before the sixteenth century. What sets the Early Modern era apart, however, is the scale to which these changes occurred, with drastic declines in wages matched by rapid increases in the cost of living and the number of impoverished. Leaders met problems of a larger scale, trying to balance their high military budgets with support of their taxpayers and creditors. All of this accumulated in a difficult road to the Industrialism that would follow, and which was a direct result of the economics and politics of warfare.

Weapons of the Medieval Era: The Quarterstaff and Halberd

By Kevin McManus

The Quarterstaff: Its Historical Context, Use, and Strategies in the Medieval Period

The quarterstaff is found in all cultures throughout the world as both a tool and a weapon. It holds a special meaning in Europe, where during the medieval period and the Renaissance it served several important roles, both as a weapon for the common folk and as a training device for the soldiers and knights, and in the modern day it has entered the mythology of the time through stories such as The Ballad of Robin Hood. Zachary Wylde, author of English Master of Defense, one of the foremost British combat experts of the 18th century, calls the quarterstaff (along with the broadsword and wrestling) a "true English Weapon." (Wylde, Website) And while many of the greatest weapons masters of the age considered it the one of the best weapons to use in one-on-one combat, few manuals give it the same coverage as the sword, or even the other pole-based weapons. (Anglo, p148)

The myths and traditions of England hold the quarterstaff as a weapon of the common folk due to its simple nature and easy construction – it was common to see travelers, farmers and other rural peoples with a quarterstaff, both to be used as a weapon and a tool, either as walking stick, a shepherd's crook, or some other tool pertaining to their craft. (Anglo, p148) There, it was traditionally made of oak saplings (being the material used by Robin Hood), and were best cut in the winter, so that there would be less sap in the wood, making it both lighter and stronger. (BQA, About Us)

Medieval and modern experts disagree, however, on some of the finer details pertaining to the quarterstaff, such as its length. According to the British Quarterstaff Association, which trains people in the use of the quarterstaff today, the optimal height of a quarterstaff is 3 inches taller than you are. (BQA, About Us) Wylde, in his English Master of Defense estimates the most common length to be around seven feet. (Wylde) George Silver, also of England, in his 1599 publication Paradoxes of Defense names the optimal to be however high you can reach with your right hand, estimating that this will be around eight or nine feet. He also notes that it is better longer than shorter, as with it longer you can hold any extra length behind you, with the main part of the staff in front, whereas if it's too short the person using it will find himself at a disadvantage against the longer pole weapons. (Silver, Section 19)

Despite being used by soldiers to train with, the quarterstaff rarely saw combat. While it was used by foot soldiers and knights during the medieval period, the quarterstaff was most often seen as a "fountainhead" for the rest of the staff-weapons, that is, once you learn the quarterstaff, you learn the rest. (Anglo, p149) Indeed, common practice in that period was to treat all similar staff weapons (the quarterstaff, the halberd, the pike, the glaive) as a single weapon in terms of training regimen and technique. (Anglo, p148) And as the simplest of these weapons in both function and design, the quarterstaff was therefore used as the tool to train with. Despite this, it was not commonly used directly in battle – it was considered to be "not suitable for a gentlemen" by some, thought unchivalric and "fit only for those engaged in premeditated violence." (Anglo, p148)

Soldiers were not the only people using quarterstaffs in combat, however. Several civilian organizations throughout Europe used the quarterstaff as a training weapon and for entertainment purposes. One such organization, the Company of the Masters of Defense of London, used the quarterstaff as a weapon in their prizes. A prize was a public demonstration made by students of the Company in order to work up towards becoming masters, and they were popular entertainment for the time. (Berry)

The fact that the quarterstaff rarely saw battle outside of citizen's fencing clubs such as the Masters of Defense is truly unfortunate, because many of the leading weapons masters of the time considered the quarterstaff to be among the greatest weapon of them all. Overall, little attempt was made to standardize and analyze combat with staves in the same sense that swords were; often their inclusion in combat manuals was for completion rather than what Sydney Anglo in Martial Arts of Renaissance Europe calls "conviction." (Anglo, p148) It was however favored by the German Masters; both Paulus Mair and Joachim Meyer, both renowned combat masters of 16th century Germany, devoted large portions of their texts to quarterstaff combat and strategy. It held a similar reputation in England, where Joseph Swetnam, author of the 1617 The Schoole of the Noble and Worthy Science of Defense, considered it the most superior hafted weapon (especially when given a spike at one end) due to its balanced nature, something all other pole-weapons lack, being too top heavy. (Anglo p167-168) In his treatise, Swetnam notes that, due to its simple nature (in contrast with the halberd, pike and "Welche-hooke") it is often underestimated by its adversary, and therefore a staff-user "cunning in the false play and slippes [may] endanger the other." He also points out that mastery with the quarterstaff gives the user knowledge on how to use the other pole-weapons as well. (Swetnam p142, Anglo p168) Wylde, mentioned above, notes that "a man that rightly understands it, may bid defiance, and laugh at any other weapon" because of its

advantage. He names it a very simple weapon with little variety, but notes that training with it lays a foundation for all other weapons (including the other staves and even swords) (Wylde)

The English master George Silver also agrees with this, saying with its “nimbleness and length” and the overall agility capable in attacking and defending with it, it is the “most advantageous” against all “weapons of weight” (battle axes, halberds, the blackbill and the like) due to the speed and agility with which one is able to fight using the quarterstaff. Against swords, daggers, and even "two sword-and-dagger men" (two men equipped with a sword in one hand and a dagger in the other) or two rapiers (two men, each with a rapier), he continues, the staff wielder has the upper hand due to his superior reach, and against the long staff and pike because it can “cross and uncross in shorter time than can the longer,” while still being long enough to cover two men at once, one on each side. Also, its length requires the wielder to move less when attacking or retreating than those fighting with swords and other similarly-lengthed weapons. (Silver, Section 26, 28) The only weapon he notes it has any disadvantage against is the Forest Bill, and then only if the other is quite skilled, otherwise the quarterstaff may still be the most effective. (Silver Section 29) Interestingly, both Swetnam and Silver agree that the quarterstaff is not “effective in dealing with an assault on a dark night” and that the wielder may want to either find high ground or “trust to thy heeles” (i.e. run away), although nowhere is it mentioned why such an issue would require special attention by not one but two masters. (Anglo, p168)

The quarterstaff is unique in history as being one of the most simple and yet effective hand-to-hand weapons, as well being the only weapon shared by the common folk and the organized military for a very long period of time. It is also noteworthy for being held by some as the most effective single-combat weapon ever, and by others being completely ignored, or shoved into a group of physically similarly but potentially different weapons.

The Quarterstaff: Use in Combat and General Strategies

Many myths from the medieval period incorporate the quarterstaff as the ultimate weapon of the common man, and it is primarily through these stories that the quarterstaff has entered the modern psyche. The best example is the first meeting of Little John and Robin Hood. The legend runs that Robin Hood is stopped on the bridge by John, who wants a toll for Robin to cross the bridge. Robin then fights John with a quarterstaff (John’s weapon of

choice) in order to not pay. This legend serves as an example of the quarterstaff's use by the common folk.

Artists Rendition of Little John - Robin Hood Fight

One of the more popular adaptation's of the Robin Hood legend is Kevin Reynold's *Robin Hood: Prince of Thieves.* In it, as in the legend, Robin Hood and John Little (aka Little John) battle with quarterstaffs over a river. The battle is everything people would expect it to be – the two hold their staffs horizontally and cross them over each other (with the two staffs forming an X again and again). This style, however, is both unrealistic and inefficient, and there is little evidence that anyone in the medieval period fought with quarterstaffs in that way.

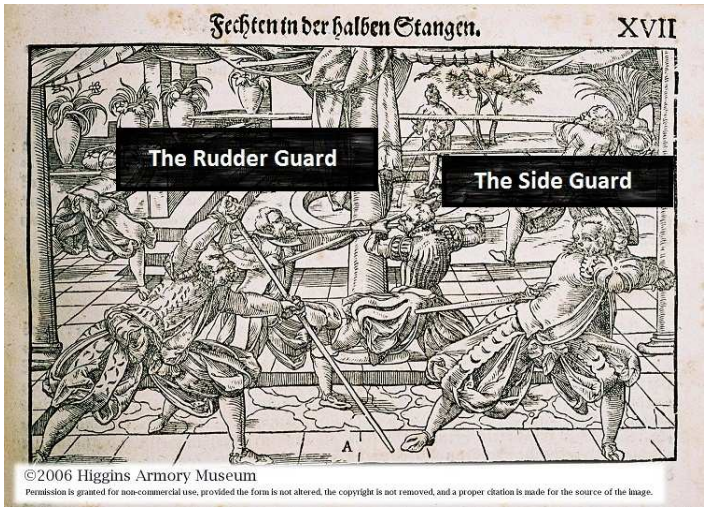
Joachim Meyer's *The Art of Combat* gives a much more effective method of fighting with quarterstaffs. Meyer, a well respected combat master in the Holy Roman Empire in the 16th century, wrote *The Art of Combat* at his dismay at the lack of other such manuals present. In it, he puts forward that the art of combat is based upon two principles, attacks (specifically "cuts and thrusts"), with which you intend to damage and defeat your enemy, and parries, which allow you to defend yourself from the "cuts and thrusts used against you." (Meyer, p42) He also describes a third element, called "The Handwork," which is the using of the other two elements so closely together that they become one. (Meyer, p 43)

Attack and Parry from "Art of Combat"

Meyer names three types of attacks, and two types of parries. The first type of attack is the high cut (or wrath cut). The second is the middle, or horizontal cut, and the third is the

low cut. He claims that all attacks, with any weapon, no matter how complex the attack is, are based on and is nothing but a combination of these three basic attacks. The two parry strategies, he notes, are to parry and then counter, or a simultaneous parry-counter. All combat is an extension of these five basic principles. (Meyer, p42)

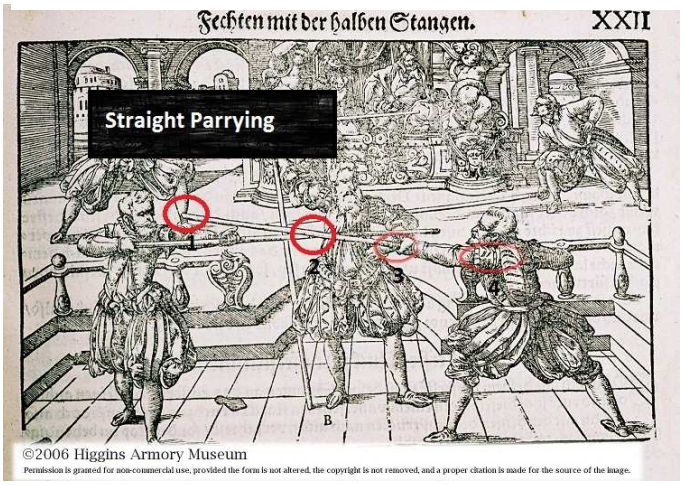
Meyer calls the quarterstaff the "basis of all long weapons," noting that all moves applied to it can be applied to any of the longer weapons, specifically including the halberd and the pike. For it he names five basic postures, or guards. For the high guard, the wielder holds the staff up in the air, with its butt at his chest, and his left foot forward. The low guard is the opposite of this, with the butt on the wielder's side, extending to the ground, again with the left foot forward. The side guard, conversely, has the right foot forward. The wielder holds the staff with the midpart on his left hip, extending the butt of the staff towards the opponent, with the tip behind him, and presenting his right side fully to his enemy (see image). For the middle guard, which Meyer notes is the guard usually fought with, the wielder holds the staff out for what Meyer calls "straight parrying," which in modern terms appears as if the wielder is holding the staff like a billiards-stick out in front of him. The final guard, the rudder guard, again has the left foot forward. The wielder holds the staff downward so that the tip is resting on the ground just in front of his left foot, and so the butt is at his face. These five positions form the basis of all quarterstaff combat. (Meyer, p249-250)



The Rudder Guard and The Side Guard

In addition to these five guards, Meyer also names four areas on the quarterstaff as effective areas for binds and parries. A bind refers to contact between the two weapons. Parries refer to the act of blocking an attack with your own weapon. The first such area is the foible, referring to the point or tip of the staff. The second is the area in front of his forward hand. The third is the middle of the staff, and the fourth is the butt, or tail end. (Meyer, p250)

Meyer was not, however, the only combat master of the period to write about the quarterstaff. The English master Joseph Swetnam, author of Schoole of the Noble and Worthy Science of Defense, also goes into some detail on the uses of a quarterstaff. Unlike Meyer, Swetnam only names two guards, the high and low, which are identical to Meyer's. Swetnam proclaims, however, that the low guard should be used exclusively, and the only reason the high guard ever be learned is in case another staff-user attempts to fight you using it.



Parrying and the Four Regions of the Quarterstaff

Another Englishman, Zachary Wylde, who wrote the English Master of Defense, gives his own take on the theme. He names four guards Inside, Outside, Medium, and Pendent. The inside and outside guards are the equivalent of Meyer's low guard, positioned to the left or right, and the pendent is Meyer's high guard. Like Swetnam, Wylde advises against the pendent due to the fact that "because the point of the staff [is] dipped, your defense is weak," and proclaims the inside and outside guards both stronger and better. (Wylde, Website)

The main body of Meyer's text goes through several very effective attacks which the user can unleash upon even a prepared opponent. He gives, for example, three moves each for both the High Guard and Low Guard on how to effectively start in combat. One other technique he describes is called (in his own words) "The Brain Blow." It starts with the two foibles bound together, with one of the combatants pretending to attack the face of the other, who should, at this point, be watching out for such an attack, and will counterthrust an attack the one makes upon him. The one, however, does not intend to actually thrust his staff, but jerks his butt, and with his left hand swings his staff around his head clockwise, and with his right hand attacks the head of the other. Meyer finishes his description of this move by noting that, should the other try to attack in the meantime, he will be ineffective because the one attacking will be too quick. (Meyer, p254)

Another of the techniques Meyer explains is called "The Taking of the Staff," the purpose of this technique being to deprive the enemy of his weapon. For this technique, both

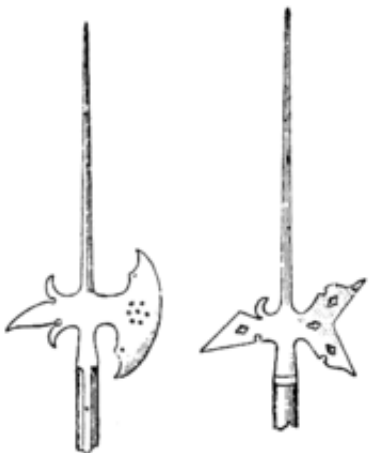
staffs are bound in the middle. The one performing the technique releases his staff with his left hand and reverses it, so that his hand is under both staves. He then grabs both staves (from underneath) and moves forward, jerking his right hand up. The other will then either let go of his staff or fall forward, should the one step behind the other while jerking his hand up. The advantage of this technique is that it is both simple and effective. (Meyer, p259)

The quarterstaff is a very powerful weapon in the hands of one trained to use it. The techniques presented by Meyer, Swetnam and Wylde are just a small portion of the texts available on combat with the quarterstaff. From them, however, it is clear that combat with the quarterstaff was much more complex and intricate than the simplistic fights present in popular culture.

The Halberd: Its Historical Context, Use, and Strategies in the Medieval Period

Foot soldiers of the Late Middle Ages and Renaissance were commonly equipped with a variety of different weapons for both ranged and melee combat. While the use of weapons varied between countries and changed throughout the period, few weapons had as much impact on the society and warfare of the day as the halberd.

The halberd is a combination cut and thrust staff weapon with an axe-like blade and a vertical spike. Later in its lifetime, which lasted from the 14th to 16th century, it gained a reversed fluke, or beak. (Waldman, p17, 99) Its name comes from the Teutonic "hild" for battle and "bard" for axe. (Brown, p164) It was "capable of splitting a man's head from pate to jaw in one blow, even through armor," and widely accepted as being a multi-purpose tool; the blade can cut or cleave, the spike can thrust, and the fluke can hook and pull a knight or other mounted enemy off their horse. Additionally, the spike and beak were capable of piercing through armor. (Edge & Paddock, p 89)



17th Century Halberd Heads

The halberd has its roots in the region now occupied by the country of Switzerland. It began with the canton, or region, of Uri, which had been given it's freedom to rule itself in the year 853. The nearby canton of Schwyz was given the same rights in 1240 by

Emperor Frederick II of the Holy Roman Empire. Unlike most people in the lower classes throughout Europe, the people here had many rights, one of which was the right to bear arms. This they did, usually to defend themselves from nearby countries trying to incorporate them. In 1262, Rudolf of Habsburg did just that, his army equipped with Danish axes, or broad axes. It is theorized that the Swiss, after their loss, took the broad axe and adapted it to their own uses, creating the halberd. (Waldman, p20-21) The Swiss continued to use the halberd as their primary weapon in battles until the end of the 15th century, at which point it was replaced by the pike. (Edge & Paddock, p 130)

Like many technologies, the halberd changed over time. At it's inception in the 13th century, the head was a long, thin blade coming to a point at the top connected to a shaft by to eyes, or rings, sometimes with a beak between the eyes. The 14th century saw the top of the blade indenting to a short spike sharpend on both sides, while the head overall became heavier and more rectangular. The beak integrated into the head. Later on, the head was socketed into the shaft instead of being connected by the eyes. During the 15th century the blades became more angular, and a flange appears between the blade and the head. The spike became aligned with the shaft, and the beak became more robust and angled downward. The spike was lengthened in the 16th century, and the blade either concaved or convected. Finally, in the 17th century the halberd's blade had a pronounced crescent shape, and elaborations appeared throughout the head. (Waldman, p105). Two examples of 17th century halberds are pictured above.

Despite being widely used by the infantry of armies, the halberd was not widely accepted by the combat masters of the day, who still favored knightly and chivalric weapons. One of the most prolific Italian combat masters was Giacomo Di Grassi, who wrote the "True Arte of Defense," published in London in 1594. According to Di Grassi, the halberd developed as an offshoot of the partisan (essentially a short sword or blade on the end of a long staff). The hook on back side (mentioned above) was added to make motions back towards the wielder (one of the basic motions possible with staff weapons) more effective; without such an addition the motion would be "idle and unprofitable," according to Di Grassi. (Anglo, p162)

While noting its efficiency, at the same time he claims that it is inferior to the bill (which he calls the *roncha*) for the exact same reason. On the bill, the hook is on the forward side, and is both longer and sharper, according to Di Grassi. He also points out that the bill is more robust and much less likely to break during combat. Despite these seeming shortcomings, Di Grassi notes that the halberd, bill and partisan are quite effective on the

battlefield for breaking up pike formations, and handles the halberd and bill together in his manual, as he sees them close enough to combine the two in terms of technique, and claims that not doing so would be a waste of both his and his reader's time. (Anglo, p162, 163)

Many of the remaining Italian combat masters viewed combat primarily as an art. These masters largely ignored the halberd and other staff weapons, or give them passing mention. One such master, Marozzo, admits to his students and readers that staff combat is meant primarily for one-on-one combat, complete with all religious rites and rituals appropriate for knightly, chivalric combat. (Anglo, p161)

Nothing, however, could be further from the truth; halberds and many of the other staff weapons were used extensively and often exclusively in combat on the army to army scale. One of the first and most important battles involving the halberd was the battle of Sempach in 1386, where the "peasants of the Swiss Confederation" massacred the army of Imperial Austria with halberds and pike. (Edge & Paddock, p 68) In the 15th century, once the Swiss had shown the halberd as an effective weapon against mounted opponents, halberd use became widespread throughout Europe, and with the pike was the standard infantry weapon. A notable exception to this was England, where the longbow and bill were preferred and also used to great effectBy the 16th century the halberd entered the realm of pomp, circumstance and ceremony; the newly formed personal guards created by the nobility throughout Europe were equipped with ornate halberds, mostly useless in battle and used primarily for ceremony and decoration. It remained on the battlefield for sometime after this, however, as a symbol of rank; sergeants and officers of similar rank were known to carry halberds up through the Renaissance and well into the 18th century. (Edge & Paddock, p 130, p152)

While few consider it to be a part of the Middle Ages, much of the colonizing of the New World, took place in the same period that the halberd saw its height of use in Europe, and therefore it was also seen in the Americas. The first use of halberds in America was by

the Spanish, who chose to use them instead of pikes when pikes were found to be completely ineffective in the wilds of Florida. It was also used extensively in their conquest and resettlement of Mexico. It was not, however, used exclusively by the Spanish: Virginian colonist Strachey in his *Martiall Law* (1612) required that sergeants carry halberds for garrison duty but abandon them for firearms in battle; by this time the halberds were used for ceremony only. During the 17th and 18th centuries (the end of the Renaissance and the beginning of the Modern Era) sergeants in the British and colonial armies carried halberds, and Americans followed that tradition through their Civil War. (Brown, p32)

Back in Europe, halberds were one of the few new technologies directly responsible for the downfall of the knight-based feudal system, and its replacement by the professional soldier. It, along with pikes, the English longbow, and gunpowder, allowed for the "common man" to defeat the mounted knight. This shift in power is therefore one of the earlier examples of industrialization on such a scale, allowing plebeians, the untrained commoners, to stand against the trained specialists, which in this case were the knights. (Edge & Paddock, p138)

The Halberd: Use in Combat and General Strategies

The halberd was a highly effective weapon in armed combat from the late Middle Ages through the Renaissance. Its roots lie with the Swiss, who first used the halberd to great effect, after which its popularity spread throughout Europe. Combat with the halberd was multi-faceted; despite its simplicity a trained halberdier could execute many different techniques using it. These techniques, moreover, were more than deadly, and the battles the halberd has seen and their results have shown how effective it can be.

Initially, the Swiss had great successes with the halberd. While it is not known when they exactly began using the halberd, one of their first successes with it was the Battle of Morgarten in 1315, where around fifteen hundred halberdiers and archers defeated some five thousand Austrian infantry and twenty-five hundred cavalry. (Waldman p21, Wikipedia) This was followed by the Battle of Sempach (1386), where around fifteen hundred to four thousand Swiss (armed with halberds and pikes) defeated four to six thousand Austrians. (Britannica) At the Battle of Arbedo, however, where the twenty-five hundred Swiss were armed almost exclusively with halberds, they were defeated by sixteen hundred Milanese.

(Wikipedia) It was at this point in history that the Swiss began using more pikemen with their halberdiers. (Waldman p55)

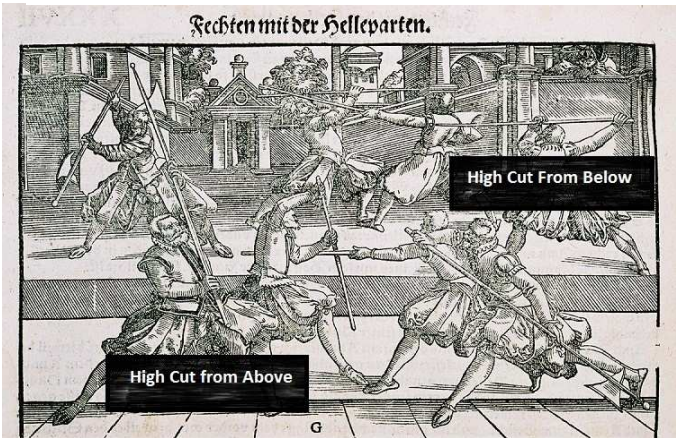
While most armies of this period were rigidly organized, the Swiss had a different tactic. Their troops were guided by a single leader who had little more to do with the strategy of the battle than to say when to attack or defend. The exact details were left to the individual combatants, who despite this lack of authority over their actions came up with the highly successful wedge formation, which they had never rehearsed or practiced. (Waldman p103)

The ultimate design for a halberd incorporated three distinct parts: an axe-like blade, a reversed hook, or beak, and a vertical spike. Within the last fifty years, a test was done to see how effective the halberd was against armor. The results of the test suggest that, while both the beak and spike were very effective in breaking through a breastplate, the blade was much less effective; the locksmith physically wielding the halberd being unable to make more than a dent in the armor. (Waldman p100)

Figure 1 - Chopping

The results of this test, however, have been called into question. Among other objections raised to it was the ineffectiveness of the axe blade. The Swiss peasants and soldiers who used the halberd in combat would have had considerably more practice with the halberd and have been more used to wielding such a weapon, having spent much of their time outside of combat chopping wood and doing other axe-related jobs. (Waldman, p100)

Figure 2 - Using the Spike



Additionally, there exists a large amount of evidence that the halberd's blade was used in combat, and extensively. One such example is the Basel woodcut "Dorneck 1499," which is a rendition of the Battle of Dorneck in 1499, in which the army

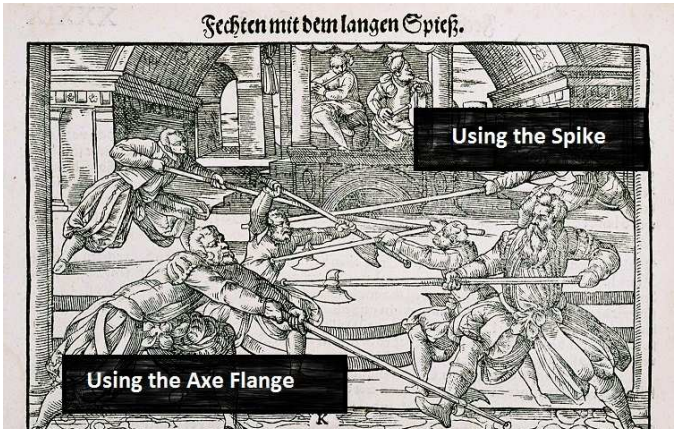
of the Old Swiss Confederacy defeated the army of Emperor Maximilian I of the Holy Roman Empire, thereby freeing Switzerland from the Holy Roman Empire. (Wikipedia) In the woodcut, the Swiss can be seen using all three of the major parts of their halberds: shown here, a soldier has a halberd raised to strike with the blade as it comes down (Figure 1), and another is puncturing another man's lower back with the spike. (Figure 2) Not explicitly shown in this painting is the beak's use; this however is not surprising as the beak had only recently appeared on halberds in this time period. (Waldman, p105) The woodcut also shows several other examples of how halberds were used in combat. (Image, Waldman p102)

Halberds were also found to be very effective at what they did. A contemporary wrote that the halberd was "capable of splitting a man's head from pate to jaw in one blow, even through armor." (Edge p89) This statement does not seem to be far from the truth; an analysis of the skulls of Austrian nobles killed at the Battle of Sempach reveals that many of them had their heads literally split open, with entire portions of their skulls simply missing. Additional analysis of the weapons that the Swiss were using during this battle suggests strongly that these blows were done with halberds. (Waldman p99)

Over time, the combat masters of the day began to take notice of the halberd, as well as the other staff weapons, and began to include them in their combat manuals. One such master, Joachim Meyer, author of *The Art of Combat* (1570), discussed the halberd in moderate detail. He states that combat with it, along with other staff weapons such as the pike, is based upon combat with the quarterstaff, which is part 2 above. (Meyer p42)

Meyer describes four basic attacks with the halberd. The first is the cross cut from above, where the user swings the halberd down from above his head to attack with the axe blade. The second is the cross cut from below, where the user swings the halberd up (or from the side), also attacking with the axe blade. These two attacks can be seen in Figure 3. (Meyer p260)

The two remaining attacks used the other two parts of the weapon. The first, what he calls "driving diagonally through the opponent", is using the vertical spike to attack your opponent. The fourth is an "opposite driving,"



which is attacking the other with the beak or the flange of the axe (i.e. driving towards yourself). These techniques are demonstrated in Figure 4. (Meyer p260)

The effectiveness and usefulness of the halberd in this time period is apparent. Not only was it effective on the battlefield, with other weapons being used in this time period it helped upset the feudalist states and usher in the modern professional army. In addition, its effect on warfare can still be seen; the bayonet, a short blade affixed to the end of a rifle still used to this day, is a direct descendent of the pike and halberd. As Meyer's manual and the woodcut of the Battle of Dorneck showed that it could be used in a variety of ways, and the skulls of the Austrian nobles showed how effective it was at what it did. In addition, its supremacy in the battlefield helped free the Swiss from the Holy Roman Empire, among other things. The democratization that began with the Swiss Cantons eventually spread throughout the remainder of Europe, and the world. It is for these reasons that it is remembered as one of the most powerful weapons of the Late Middle Ages.

The Foot Soldier: Arms, Armor and Lifestyle.

By Matt Sonntag

Weapons

The arsenal of the average foot soldier during the medieval period varies among the different time periods. In the time around the 1300s to the mid 1400s the weapon set of the average soldier was a scattered mishmash of different classes and subclasses of weaponry. These weapons included bladed weapons like swords or daggers, pole weapons like spears, halberds, and pole axes, bows, and blunt weapons like hammers or maces.

Infantry men in the early medieval period carried bows, blades or pole arms, blunt weapons and most soldiers regardless of their primary weapon, carried a dagger as a sidearm, much as the modern infantryman carries a pistol. Bladed weapons (referring here to weapons similar to a sword, consisting of a handle of some kind and a metal blade) included, swords which could range in size from a foot or so long short sword to a two handed claymore, and daggers, which tended to be quite short by comparison (on average 170mm) (DeVries 1992).

Men fighting with Daggers
www.schlachtschule.org/a-dagger/2HTwistOut.html

Horseman's axe 1475

Wikipedia.org

Flanged Maces

Wikipedia.org

To be clear, when axes are referred to in this paper, it is in reference to weapons similar to those shown in the right, please keep in mind however that though these are similar to the shape and style of a medieval axe they are by no means identical to axes used at the time. Axes ranged from the smaller single sided axe to a much larger two handed axe. Pole arms (here referring to weapons consisting of a long wood shaft with a metal head) included weapons such as spears, halberds, poleaxes, and quarter staffs. Blunt weapons will be defined in this paper as

weapons used almost exclusively for bludgeoning (for the purposes of this paper they will be considered a subclass of pole arms). Blunt weapons included weapons such as hammers, maces, clubs, and flails (shown right). Which weapons were used by the close range infantry wasn't a true focus in tactics of this era (fourteenth to the mid fifteenth century).

In the earlier portions of the middle ages, the battlefield was dominated by cavalry. Mounted knights were the most effective weapons, and therefore all military tactics revolved mainly around either implementing or defeating them. Infantry were largely used in support of either of these goals. Formations of archers would be employed largely to harry charging cavalry before they could reach the lines of allied infantry, or in the defense of fortified positions, as height made a tremendous difference in the effectiveness of arrows against armored opponents. Large groups of close range infantry were employed as the all purpose soldiers. Infantry equipped with spear could ward off cavalry, while infantry armed with more close in bladed weapons, such as swords and axes could be used to fight off opposing infantry.

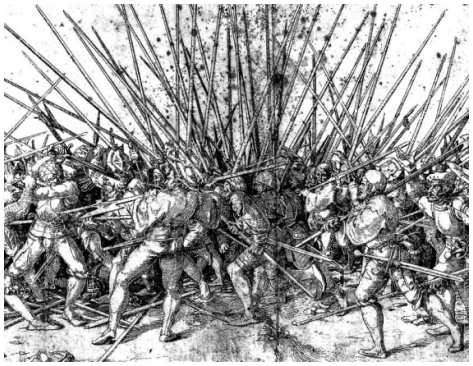
It was because of this cavalric domination of the battlefield that a certain farm tool evolved into a weapon capable of allowing a coordinated infantry unit defeat cavalry. The scythe was originally a tool used by farmers to harvest their crops. However some time around 1000 A.D. the scythe was first recognized as a potential tool for battle when foragers gained experience "victualling the cavalry" and "Rough needs resulted in the transformation of the light field tool into a robust one, which in turn was soon found servicable as a weapon, so foragers assumed the nature of a fighting force."(R. Held 1979: 6-7) These farmers turned soldiers would have been, due to their status, infantry men, and since earlier in the medieval period most infantry men were responsible for providing their own equipment[3(p.188-189)] they would have brought whatever they could as weaponry, and thus we have the introduction of the scythe to combat. The scythe also gave rise to a weapon referred to as the glaive. "The glaive derived directly from its agricultural prototype only in that (a) its point, instead of curving down toward sthe cutting edge, bent up towards the blunt back…and (b) the blade was mounted coaxially at the end of the pole, not laterally as a flag flies(R. Held 1979: 6)." The full introduction of the glaive, its relative the halberd and the introduction of advanced archery tactics somewhat lessened the dominance of cavalry on the medieval battlefield.

Archeological records show that the spear was, during the dark ages, the most popular weapon among all sects of society. It was a versatile, easy to use weapon that could be produced cheaply and used effectively against a wide range of opponents. The weapon

remained very popular among the lower classes, due to its relative ease of use, and its cost-effectiveness. Spears at the dawn of the middle ages were relatively short, when compared with the pikes that they evolved into. They usually ranged in length from six to eight feet and consisted of a "haft of wood with a short iron head, finely sharpened on both sides" (Contamine 1984: 176-177), the spear head often sported curved hooks therefore making it more difficult drive too deep, or to aid in fencing.

The introduction of the pike into military tactics proved to be the final step in the shift from the focus on cavalry to infantry formations. The pike is a two handed derivative of the spear. The pike itself was a weapon of impressive length, ranging from fourteen to twenty-four feet in length. Like its relative the spear, it was quite easy to use in combat, especially in a coordinated formation, and it was very cheap to produce, making it an excellent choice for a standardized unit weapon. The first medieval people to take full advantage of the pike were the Swiss. The Swiss pike men became such a potent mercenary fighting force that much of the military tactics of the era (sometime between 1475-1477) revolved around either implementing them effectively or finding effective ways of countering them for the next two hundred years.(Bennet, Bradbury, DeVries, Dickie, Jestice 2005: 57)

Pike tactics can be divided into three different categories: Attack, Defense, and Movement. Due to the weapon's sheer size carrying it in formation was no simple task, as even the slightest movement at the base of the weapon would result in a much larger movement that the tip. Beyond movement, the implementation of the pike offensively or defensively depended purely upon the opponent. Against pike men or infantry men the soldiers would be formed up into a tight line formation with pikes forward, braced against the shoulders of the men behind them. After assuming this formation, the entire unit would advance slowly towards their opponent until contact was made. The second combat formation, used against cavalry, involved crouching down and planting the butt of the pike against the inside of the soldier's foot. This allowed the soldiers to block the tremendous force of charging cavalry by using the ground to absorb most of the impact. Due in large portion to the implementation of these strategies, the use of longer and longer pikes became common, effectively increasing the average length of a pike from sixteen to twenty-four feet.



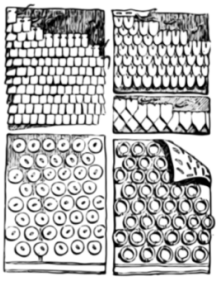
Swiss and Landsknecht pikemen fight at "push of pike" during the Italian Wars. Wikipedia.org

In relation to the actual IQP project, it can be ascertained from the above information that the medieval foot soldier underwent an evolution from a unit used to flesh out an army, and support cavalry, to a unit which was the backbone of any and all European armies of the period, until the introduction and implementation of firearms. Since this project will largely focus on the infantry man and his methods of combat this fact is a particularly important one to note, since it provides a fairly wide window of options for the final presentation.

Armor

The term "Foot Soldier" encompasses and extremely large demographic of soldiers. The armor they used varied drastically based on the soldier's status, what unit he was in, and his position within that unit. There were two basic classifications of armor, those being, "hard" armor, and "soft" armor. "Soft" armors were typically made out of materials such as leather or cloth, occasionally with metal sewn onto the surface. Some basic variations of "hard" armor are mail and plate armor, the former being less expensive and more common, and the latter being more expensive and effective. All these types of armor were used both separately and in conjunction with one another.

Soft armors, such as leather and scale armor were the most commonly used type of armor during the medieval period. This was largely due to the fact that they were significantly less expensive than armors like chainmail, or heavy plate armor. Though this armor didn't provide as much protection as armor made of metal, it allowed for a great deal of mobility. Medieval warriors were often protected by "a tunic of thick material or leather covered with little metal scales, strips or, eventually, iron rings (shown right)."(Contamine 1984: 184)



Examples of early armour construction. The top two sections are examples of scale armour.
Wikipedia.org

Mail hauberk from the museum of Bayeux
Wikipedia.org

Chainmail was one of the most largely employed types of armor in Western Europe (Bennet, Bradbury, DeVries, Dickie, Jestice 2005: 110-111). It consisted of "35,000 to 40,000 rings…for an Alamanic coat of mail, like a shirt with a hood and two very short sleeves, the tunic coming down to the thighs or knees" (DeVries 1992). An

example of a typical chainmail tunic is seen to the left.

Plate armor consists of thick metal plates strapped together over the body with leather straps. Plate armor for foot soldiers varies throughout the medieval period, though mostly one can divide it up into sections of the body. A breast plate to protect the chest, arm and shoulder guards and plates covering the shins and thighs, are examples of some of the primary classifications. Most foot soldiers didn't wear plate armor often in the middle ages (during the 14th and early 15th century) mainly due to its expense; this will be discussed at length later. Also, the foot soldiers who did wear plate, often didn't wear leg armor as it would hinder mobility.

Head coverings (like helmets) can be used with both types of armor. Head coverings could be something as simple as a piece of chainmail with an opening for the face or a leather cap, or as elaborate as a full steel helmet with a visor. Helmets were the first piece of armor that would be purchased by a soldier, especially if that soldier could only afford one piece of armor.

There were two major systems of equipping troops by the mid fifteenth century (Contamine 1984: 188-191). The first was where each individual combatant is responsible for providing his own armor, weapons, etc. and each soldier ends up equipped based on his own desire for security and efficiency. The second model would involve the governing body controlling an armed force, standardizing the equipment by taking it into their own hands to purchase and equip the troops. Due to its expense the second method never became terribly widespread, and the former dominated throughout the middle ages.

These two methods were not absolutes, however. Many governments blended the two, making the soldiers responsible for varying degrees of their own equipment. This was by far the most common system during this period, since it allowed for some semblance of uniformity, and consistency among the troops, but it also did not overly strain the finances of the government.

One prime example of infantry that were well equipped by the government was the Swiss pikes (seen left). The Swiss pike men were well trained and heavily armored mercenaries rented out by the Swiss government. "A typical Swiss Pikeman" (around the time of the Burgundian wars 1475-1477) "wore a sallet, while his body would be protected by both mail and plate armor. The legs were the most lightly armored to

allow for freedom of movement" (Bennet, Bradbury, DeVries, Dickie, Jestice 2005: 57). The pike men in the front of a Swiss pike block would be more heavily armoured than those in the far back ranks. The astounding success of these soldiers caused a significant shift in military tactics, for the next 200 years, to emphasize the use of pikemen.

This portrait depicts the battle of Orsha, which took place on September 8th 1514, and was fought by the allied forces of the Duchy of Lithuania and the Kingdom of Poland and the army of the Grand Duchy of Moscow. The above portrait of the battle depicts many diverse kinds of soldiers. This portrait gives insight into the different kinds of soldiers and how they were employed on the battlefield.(R. Held 1979: 109-115).

To the far bottom right corner you can see armored infantry men, all of whom are using some variety of pole arms. One can also observe in this area that these soldiers are all armored differently, though the armor they wear protects the same general areas. They all seem to be wearing a breast plate of some kind, and relatively minimal arm protection, several of them have helmets, and those that do are all of different varieties.

Looking just ahead of the aforementioned infantryman one can observe a group of relatively unarmored infantry men pulling a cannon. These men seem to be equipped only with a sword for a weapon and either wear a helmet, a breastplate both, or neither. It can be surmised that because these men likely were employed purely to operate the cannon and support the other troops as artillery, they were not alotted armor since it would have been unnecessary because they would likely never see combat at a range close enough for the armor to be relevant.

In the center of the portrait one can observe two rows of heavily armored Polish infantry. They are depicted here wearing overly fanciful tournament armor which would never have been worn in actual military action (R. Held 1979: 126). The implication holds true however, as it can be drawn from this that heavy infantry in the battle would have been thus armored. The following lines are all somewhat less armored, however they still all seem to be wearing breast plates and helmets. They also carry matchlock muskets, indicating that this weapon was becoming more popular, to the point where it was being employed on the battlefield in a coordinated manner.

To summarize, the medieval foot soldier was armored in a diverse fashion, though their armor most often reflected their position in the unit and importance. Some soldiers were clad in full plate, these were most likely soldiers whose role it was to be front line defenders, or in the earlier portions of the medieval period, simply someone more wealthy than the other soldiers. Armor itself varied greatly, though it can be divided for the purposes of this project into two separate categories, hard and soft. The former was more cumbersome and expensive, though it gave better protection, the latter was lighter and more inexpensive, at the expense of protection.

Lifestyle and societal role

The term foot soldier applies to a wide range of military units within the late Medieval and Early Renaissance eras. To be clear the main purpose of this paper will be to address the standing and lifestyle of the soldiers who were either of a lower caste (i.e. peasants), mercenaries, or professional soldiers. This paper will address how soldiers were recruited, how they were armed, what their living conditions while enlisted were like, and what they would be paid throughout the period of interest (1300-1700).

In the year 1233, when King James I of Aragon set out to attack the kingdom of Valencia, he had an army made up mostly of men who owed him some sort of feudal service. "Therefore, [the army was] made up partly of part-time warriors who only fought when summoned by the king or ruler, and partly by professional warriors who fought because of a personal contract with the king: because they were part of his household or because he had appointed them to an office which involved military service (Nicholson 2004)." Because of this sort of assembly, where feudal obligation was one of the primary driving factors in the assembly of an army, it was quite difficult for a legitimately coherent and professional army to be assembled during this time period (this is not to say that professional soldiers did not exist, only that they were not nearly as common as they would become in centuries to come.)

Recruitment by King Edward III of England to fight with Scotland, Wales, and Ireland, was one of the first instances near the time of interest. Around the year 1327 (Contamine 1984: 150-151), King Edward had three options for the recruitment of soldiers. The first was to call upon those obligated to him by feudal service. Based on these summons a tenant would be required to bring both himself and his contingents to a specified location on a specified date. The second method of recruitment involved recruitment by commission. Soldiers were recruited, armed, paid, and led to the assembly area all by professional recruiters hired by the king. Any soldiers who were seen as being unfit to fight would be turned away by these recruiters. The final category is volunteers; surprising numbers of men would join the fight for various personal reasons (often because they viewed it as a way out of their current lot in life). Records show that, around the year 1300, an English foot soldier would have been paid about 2d (2.6 grams of silver) (Contamine 1984: 94-96). In France at the same time, a foot soldier would have been paid about 10d (3.34 grams of silver). To compare, knights at the same time would have been paid between 2-4s (31.12 and 62.24 grams of silver) in England, and between 10-15s (33.48 and 50.22 grams of silver) in France. These wages were paid daily, but at the same time famine had driven the prices of food and

drinks to heights barely covered by these wages, to the point where “a chicken was sold for 6d, a bushel of wheat for 20s, a gallon of wine for 2s or more, and bread for 2-3d.” Because of these wages, volunteer service virtually disappeared.

In 1588 a document detailing the cost to maintain troops under Spanish command for one month gives an idea of the general wages a soldier would have been paid at the time (Tincey:8-10). The 8718 Spanish infantrymen would have been paid 62,239 crowns meaning around 7 crowns were allocated to each person. This amount would also have been used to cover arms, armor, and necessary for the soldier, as well as being used to pay the soldier’s wages. For comparison the commander of the cavalry was paid 500 crowns and the Master of the Camps General 1000 crowns (Tincey: 9-10).

As time progressed it became more widely practiced to have a standardized set of equipment for soldiers. By the late 1600s there was a much more coherent set of standards for what each soldier should be carrying into battle. At this point in time Pike men were to be armed with “a pike seventeen feet long, head and all; (the diameter of the staff to be one inch ¾, the head to be well steeled, eight inches long, broad, strong and sword-pointed; the cheeks two foot long, well riveted; the butt end bound with a ring of iron) a Gorget, back, breast, tassets and head-pieced, a good sword of three foot long, cutting and stiff-pointed with a Girdle and Hangers (Barriffe 1661: 11).” From this statement it can be seen that the pike men’s equipment, while very specific when speaking about the pike’s structure, is fairly simplistic. Most of the equipment listed above could be produced at a low price, making it affordable to arm a large number of soldiers. It is also important to note that “cheeks” on the pike, were strips of steel riveted to the sides of the pike near the head to prevent an opponent from hacking off the pike head with a sword.

Men dressed as Pikemen
www.ecwsa.org/Galleries/Stralsund2003gallery.htm

DeGheyn, Jacob. (1607). *The Renaissance Drill Book.* Greenhill Books

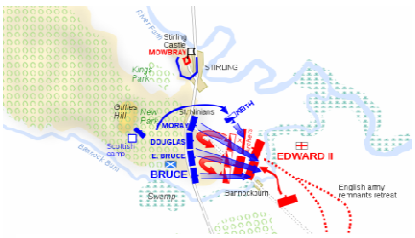
One of the other important members of armies during this time period, the musketeer, also had a fairly well laid out set of equipment. "The Musketier must be armed with a good

musket, (the barrel of 4 foot long, the bore of 12 bullets in the good pound rowling in) a rest, bandelier, head-piece, a good sword, Girdle and Hangers (Barriffe 1661: 13)." In essence a musketeer's money was spent mostly in acquiring his musket, powder and musket balls, with less focus on acquiring armor.

Techniques and Tactics

The foot soldier's actual training, technique and the tactics with which he was employed vary greatly within the time of interest for this project (1300-1700). Within that short four-hundred year time period the average foot soldier changed from a largely untrained, uncoordinated being, to a well trained, tactical keystone. This paper will first address the general tactics used early in our time period and then move on to later times when the tactics became more complex as soldiers became more professional.

In Italy and Germany laws like the "Folgepflickt" were enforced during the late thirteenth and late fourteenth centuries (Contamine 1984). These required all citizens save women, shepherds, clerics and servants of the churches to have arms. Because of laws like this when a king made a call to arms, he could take thousands of soldiers from any number of communities within his kingdom, all of whom would already have arms of some kind. It can be inferred from this fact that a large portion of the armies called at the time were made up of soldiers who had little or no combat experience. The tactics of the time largely reflected this knowledge.



kburn:

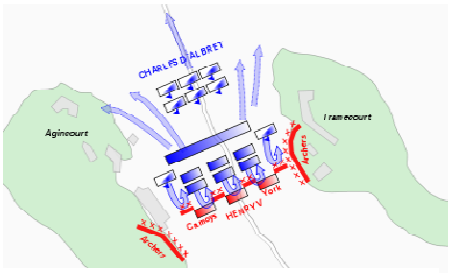
A battle between England and Scotland exemplifies this point somewhat. The Battle at Bannockburn (1314) was fought between King Edward II of England and King Robert Bruce of Scotland. King Edward had called together an impressive army of about twelve-thousand foot, over half of which were archers, and two-thousand cavalry. Robert's army was reportedly only about two-thirds that amount, numbering around ten thousand foot, with far fewer archers than the English army, and only three hundred light cavalry (Bennet, Bradbury, DeVries, Dickie, Jestice 2005: 38-42).

It is important to note that the English army originally numbered nearly twenty thousand foot, but desertions were very commonplace in medieval armies, to an extent that is incomprehensible today, this indicates a very loose sense of fealty between the soldiers and

their leaders. At the time "soldiers were not obligated to serve for long periods of time, and often could not be kept on campaign, even deserting in numbers inconceivable in a modern army" (Bennet, Bradbury, DeVries, Dickie, Jestice 2005: 40-42).

This battle demonstrates the difficulty in manipulating such a large number of troops who have had very little actual military training. Because the battle was fought on a swampy Moorish territory that the English soldiers were not accustomed to, and because Edward had such a large host, it became increasingly difficult for him to move and coordinate his army with any sort of respectable speed. Taking advantage of these weaknesses, the Scots outmaneuvered the much larger English army. King Edward sensing defeat took his entire personal body guard and fled. Seeing the king flee, much of the army fell into disarray and what started as a defeat turned into a complete rout. Only one group actually made it back to English territory. It was comprised entirely of foot soldiers, and they only survived because their commander kept them banded together. In total the English casualties are estimated to be somewhere around two thirds of their original host. Comparatively the Scots' casualties were surprisingly light, they were said to have only lost two knights(Bennet, Bradbury, DeVries, Dickie, Jestice 2005: 40-42).

As has already been stated in the previous paper, the pike men, specifically the Swiss pike men, were integral in the switch from a focus on knights backed by sheer numbers of largely untrained infantry to a focus on large blocks of well trained infantry. These soldiers could be armed, equipped, and trained much more cheaply and quickly than knights, but were just as, if not more, effective in combat. Also using professional soldiers made coordinating battles much more fluid.



rg

Thus combat tactics of the era (1400s-1700) (Contamine 1984: 132-135) revolved around deploying the pike men effectively against opposing troops, and countering the pikes used by the enemy. One of the earlier methods, which worked quite well, was the English technique of outflanking pike men with archers. This method "started at Duplin and went on successfully to Agincourt (1415) and Verneuil (1424)." After that the technique died out for the most part across Europe, save in England where it remained up until around the Battle of Flodden (1514). "On the continent it had been recognized that the system was essentially a defensive one only effective against an enemy which was obliging enough to attack an English Army placed in a good position"(Oman 1937). One of the battles which sounded the

death knell for this tactic was Formigny (1450). "The little army of Gough and the Kyriel had been bombarded by artillery in its position, till it was forced to come out and counter-attack the pestilent guns—with disastrous results" (Oman 1937).

One of the key advantages to using pike men as the major driving force in an army, as mentioned earlier, is the fact that they could be trained easily and cheaply. A perfect example of just how easily can be found in the drill instructions left behind from the era. Pike drills were fairly simplistic, and a bit of practice each day would allow most anyone to fight effectively as a part of a pike block.

There are six major positions which will be covered in this paper. The first was "Pike to Order". In this position one would stand with the right foot slightly forward and pointed slightly away from your left, resting the pike on the ground slightly in front of the end of the right foot. This at rest position is meant as a standstill position from which any other position can be assumed. The second, "Advance your pike" consisted of first aligning the left and right foot, so that the left foot is placed sideways directly behind the right foot, which is pointed forward. The pike is then brought up so that it is rested vertically against the shoulder. This is a position kept for short marches. The third position is "shoulder your pike" this move ends with the pike resting at about a forty five degree angle over the right shoulder. This more casual marching position is meant to be used over long marches so as not to fatigue the troops. The fourth position "charge your pike" is an offensive position where the pike is pointed tip forward, and the back end is supported with the butt in the right hand braced against the shoulder of the man one line back. The fifth position "check your pike" is meant to inspect the end of the pike, it consists of dropping the pike down so that one's hand is a bit over a foot away from the head. The sixth and final position to be addressed is "Charge your pike for horse and draw your sword". The name of this position is somewhat self explanatory, it was a technique used to counter a cavalry charge. The pike is planted against the ground and right foot, and held in the left hand, which is braced against the left knee. The right hand is placed on the hilt of one's sword, ready to draw (Gheyn 2003: 185-247).

Pikeman
DeGheyn, Jacob. (1607). *The Renaissance Drill Book.* Greenhill Books

Team Biographies

Huan Lai

Huan was a student of computer sci
Who strived to learn the worldly knowledge.
From Boston he came of the family Lai
On a cruise he went, the road called college.
And then he came upon medieval arms,
From there a project with his friends ensued,
To show the world the past's hidden charms.
The life of the footman clearly construed.
He read, he reasoned the broader idea;
He sought to see the what and when and how,
And pursued to see beyond the veneer
That simply reading the facts would allow.
But as he leaves he can't help but believe
That the work he's done will be well received.

Matthew Sonntag

Matthew Sonntag is a bio-engineer
From little Clinton town he grew of age
He loved the ancient times and those more near
To learn, to grow, Worcester a fitting stage
An institute of modern science thought
Was where he decided to learn what from
This world and him he could and not have wrought
Here was a stirring place of learn'd maelstrom
Then to an armory with suits of old
Deep down to a bearded man in armor
Gave he the pike and lance to us to hold
And off we set to tell of pikes' glamour
To bring down the knight's tails so egregious
Our work like pikes to hold like the Aegis

Jotham Kildea

Jotham, graduate in year eleven;
He from Canterbury made his movement.
Thereby he hoped to his knowledge deepen,
Focused on computers and management.
When free time can be found in abundance,
Quick as a bear he heads to the forest;
Hiking, biking, living to life’s cadence.
Off to foreign lands, just as a tourist.
During research his work was high level,
Renaissance warfare had been his focus.
Sharing it with his group he would revel,
Often meeting at the Higgin’s locus.
Throughout this project so much had he learned,
But best of all was the wisdom hence earned.

Kevin McManus

How to develop computer-like games
that's what my goal is to learn, don't you know.
Not from Alaska, I've ne'er seen the Thames,
I grew up in nearby city "Mall-bro".
Higgins Armory, man that place is cool.
I spent a lot of my time there this year.
I can use what I learned there here at school.
I worked with a team, not alone. (don't fear!)
The project is done, but man was it fun.
An experience I'll never forget.
Truth be told I can't believe it's all done.
This isn't something I'll ever regret.
That is my sonnet, I hope it was good.
Don't you know I did the best that i could.

Conclusion

This project was a learning experience for all of us. Beginning with the PQP in D term of 2009, we found it challenging to maintain consistency as our research topics spread into a larger and larger amount of options. As each week progressed however, we were able to refine our options until, at the end of the school year, we had a better idea of the direction the project was going to take.

Upon regrouping in A-Term, we quickly delved into in-depth individual research papers on the topics we had chosen during the PQP. While the research at times was exhaustive, we found it enjoyable to become "experts" (at least within the group) on our chosen fields. It was at this time that one of our members, Amanda Connor, chose to leave the group. The remaining four of us buckled down against all odds, braving the great unknown. We continued forward.

It was almost at the end of A-Term that we finally decided upon our project topic. The advantage of choosing a topic at this point in the project may not seem clear, but to us was a great advantage. Having done the bulk of our necessary research, we were able to formulate a project topic that was relevant and well-rounded. After some finagling over details, we ultimately decided upon a single presentation centered on the pike drill, and the common soldier. Another option we had considered was three presentations, each expanding on the last – the average person at that time, a regiment of soldiers at drill, and an army during a siege. We ultimately chose to do a single presentation, as this allowed us to focus all of our efforts on making this presentation the highest quality we were able to do in the remaining months.

At this point in the project it was the second week of B-Term, we had a wealth of background information and an outline of a presentation in our minds. This term began entirely centered around the group working together to create the presentation, and as it progressed we once again segregated ourselves to generate the necessary background information for the presentation. It was during this time period – the shift between creating the presentation and the background information that the group's effort began to wane. All of us are in agreement that this had nothing to do with the project and everything to do with Thanksgiving Break. After we returned from break the group reorganized and remotivated itself with a new goal:

delivering a quality document to the Armory's Education Department by the end of term. I am glad to report that our efforts were not in vain.

Also during this term the group was able to perform the presentation several times, both with the assistance of the Wolfe Argent (a group of period performers that work with the Armory), and on our own. For many of us, this would be the first presentation done outside of academia, and we found it daunting to say the least. Doing the beta presentations, however, was the best measure of the quality of our work and the comprehension of the topic by the audience, and allowed us to move further than we would have without them.

As it is currently (at the time of this writing) the second week of C-Term, I can only say with certainty what has already happened. At this time, the presentation itself is fairly well of, and most of our efforts have gone into Pre and Post visit materials in order. One of the greater challenges has been an interactive online component, which is still in development. It remains to be seen how the project overall will conclude.

Over the course of this project, we have come up with a fairly versatile format that future presentations could follow. It is our belief that having future IQP teams build upon our work would result in very successful (and mutually beneficial) collaborations between WPI and Higgins Armory. We have high hopes that future IQP students will construct other, diverse presentations such as ours that will benefit the museum.

In terms of how to improve the IQP process, we feel that one of the few places in the process that could be improved is the beginning. We feel that beginning with more of a focus would allow for more time later in the process to further develop and refine the deliverables. This may result in groups having enough time to do more than one presentation while maintaining the quality we have set. Sticking with a single presentation, however, would still be a viable option; the ultimate quality of the deliverables overall would be similarly improved.

These things aside, we all found the project as a whole to be very successful and fulfilling.

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Gheyn, Jacques de. Gheyn, Jacob De. Translated by Blackmore, David J.. (2003). *The Renaissance Drill Book.* Greenhill Books/Lionel Leventhal, Limited. "This book was one of the foremost reference books for combat drills in its heyday."

Gies, Frances; Gies, Joseph. (1998). *A Medieval Family: The Pastons of fifteenth-century England.* New York, NY: HarperCollins Publishers. "This book seems to give somewhat of a perspective as to how various conflicts during the Medieval period started, and in turn how they affected the people, both common and noble"

Gies, Joseph. Gies, Frances. (1979). Life in a Medieval Castle. New York: Harper & Row. "This book focuses on the function of a castle in medieval life. Though this is slightly off topic from the Foot soldier, I thought it might provide some insight as to how his life may have been, living near a castle, or as a part of a military unit, attacking one"

Lynn, John A. (2003). *Battle: A History of Combat and Culture.* Boulder, Colo.: Westview Press. "This book, as the title suggests, gives a historical perspective as to how combat was integrated into society and culture at different points in history. This information is definitely a must, since my topic focuses largely on who the foot soldier was as a person."

Nicolle, David. (1999). *Arms and Armour of the Crusading era*. London: Greenhill Books ; Mechanicsburg, Pa. (circa 1050 to circa 1350). Library link: http://library.wpi.edu/cgi-bin/Pwebrecon.cgi?BBID=189645, "Book detailing some of the arms and armour used during the crusades era"

Nicolle, David. (2004). Medieval Warfare Source Book. Edition: illustrated Published by Brockhampton Press. "A general handbook detailing Medieval Warfare"

Norman, A Vesey B. (1971). *The Medieval Soldier*. New York, Crowell. "A book recommended by Jeffrey L. Forgeng, it seems to be a book which fully encompasses my topic, as its name reflects the name of my topic"

Showalter, Dennis E. Astore, William J. The Early Modern World: Soldiers' Lives Through History. Westport, Conn.: Greenwood Press. "Another book which takes a look at the lives of soldiers in the Medieval and other times."

Talhoffer, Hans. Rector, Mark. (2000), *Medieval Combat: A Fifteenth-century illustrated manual of swordfighting and close-quarter combat. (circa 1420 to circa1490)* "This book covers a range of common combat techniques with various weapons.

Urban, William L. (2006). *Medieval Mercenaries: The Business of War*. London: Greenhill Books, "A modern book detailing the mercenary and his importance to medieval combat"

Windrow, Martin. Wilkinson, Frederick. (1971). The Universal Soldier: fourteen studies in Campaign life, A.D. 43-1944. Garden City, N.Y., Doubleday. "This book has particular relevance to my topic as it will discuss the life of a soldier during a military campaign."

Books Online:

Fritze , Ronald H. William Baxter Robinson. (2002). *Historical Dictionary of LateMedieval England, 1272-1485*. Edition: illustrated Published by Greenwood Publishing Group. "This book provides a great deal of articles and specialized monographs about the Medieval Period, as well as historical interpretations by various scholars"

Lindholm , David. Nicolle, David. McBride, Angus. (2003). *Medival Scandinavian Armies (2)*. Illustrated by Angus McBride Edition: illustrated Published by Osprey Publishing. "This book details the later Middle ages as in the Scandinavian region, I thought it might have some interesting information as to the differences between foot soldiers there as compared to the rest of Europe".

Newman , Paul B. (2001). *Daily life in the Middle Ages.* Edition: 2, illustrated Published by McFarland. "This book has obvious importance to my topic as the foot soldier's lifestyle would have great relevance to our understanding of him"

Nicholson, Helen J. (2004). *Medieval Warfare: Theory and Practice of War in Europe, 300-1500*. Edition: illustrated Published by Palgrave Macmillan. "This book gives a sweeping overview of warfare in the Middle Ages"

Verbruggen , J. F. (1997). *The Art of Warfare in Western Europe during the Middle Ages from the Eighth Century: From the Eighth Century to 1340*. Edition: 2, reprint,

illustrated Published by Boydell & Brewer. "This Book seems to have a great deal of information in its later pages about the importance of foot soldiers to medieval warfare during the general timeframe we'll be looking at"

Websites:

http://library.thinkquest.org/10949/fief/medsoldier.html, © Copyright the 1997 Thinkquest 10949 Team. "This site was fairly typical of the websites that came up while searching for things such as "Medieval Soldier" or "Medieval Foot Soldier". It had relatively few things in the way of a bibliography and a scant amount of basic information about the topic."

PDFs:

HAM comprehensive listing of arms and armor pieces. This PDF which was also given at the last meeting, "contains information on several pieces of armor which might be useful to learning about armored combat."

Videos:

Modern Marvels: Battle Gear. (2005). History Channel; New York, NY. "This video while probably overly generalized, may provide some useful information as it starts by discussing the Medieval Foot soldier"

Karn , Richard. (1998). The Medieval Soldier. New York: A&E Television Networks: A&E Home Video: Distributed by New Video Group. "This is a video that documents the Medieval Soldier, since this is the focus of my topic, this video may be helpful"

A&E. (1998). Foot Soldier: The medieval Soldier. New York: A & E Home Video. "I suspect that this may be a copy of the above source under a different name, but I see no harm in adding it to the list just to be sure"

Contacts:

Bob Reed, jlrr@comcast.net<mailto:jlrr@comcast.net>, (603) 598-6813 "Wolfe Argent is his group, he is at the museum every first Saturday, plan to show up on a first Saturday not later than early A-term to meet them."

Paul Kenworthy, mesketet@tiac.net<mailto:mesketet@tiac.net>, (781) 231-5988 "Paul's group do 17th-century pike drill; scheduling is less regular, but still plan to find a way to meet him or them not later than early A-term."

Jeffrey L. Forgeng, jforgeng@WPI.EDU, "IQP advisor, and liaison to several relevant sources and contacts, as well as being an important source himself."

The Evolution of Military Organization and the Rise of Military Professionalism

Books / Articles:

Bachrach, Bernard S. (1994). Medieval Siege Warfare: A Reconnaissance.

The Journal of Military History, 58(1). http://www.jstor.org/stable/2944182

Detailed account of the use of siege weaponry and the tactics revolving around them. Bachrach goes into detail covering the tactics around defending against siege weapons as well as using them in attacks against fortifications.

Bradbury, Jim. (2004) *The Routledge Companion to Medieval Warfare.* London: Routledge.

Examines castle architecture, ship building technique and developments in arms and armor, fortifications, tactics and supply. Covers the whole geographical area of Medieval Europe.

Contamine, Philippe. (1986). *War in the Middle Ages.* Wiley-Blackwell.

WPI Library

Study of war during the Middle Ages, covering military customs, conditions of various Western European states, armor and weaponry, soldier recruitment and rules of combat.

Carey, Brian Todd. (2006). *Warfare in the Medieval World.* Barnsley, South Yorkshire: Pen and Sword.

Exploration of thirty-three battle, analyzing the relationship between light and heavy infantry and light and heavy cavalry and the evolution of shock and missile combat.

Delbruck, Hans. (1985). *History of the Art of War Within the Framework of Political History.* Westport, Connecticut: Greenwood Press.

Extensive study of the military history of European warfare and the art of war in the greater context of human and social development.

Devries, Kelly Robert. (1996). *Infantry Warfare in the Early Fourteenth Century: Discipline, Tactics and Technology.* Rochester, NY: Boydell Press.

Analysis of the importance of infantry in Medieval warfare, including the role of infantry and the nature of infantry tactics.

DeVries, Kelly Robert. (1992). *Medieval Military Technology.* Peterborough, Ont.: Broadview Press.

Covers arms, the introduction of armor, gunpowder, the use of fortifications, and naval weaponry, and does so while showing how medieval military technology is connected in broader ways to Medieval society.

Hall, Bert S. (1997). *Weapons and Warfare in Renaissance Europe: Gunpowder, Technology and Tactics.* Johns Hopkins University Press.

Study of the development and diffusion of firearms and the effects it had on military warfare from the inception of gunpowder weapons up until the Military Revolution.

France, John. (1999). *Western Warfare in the Age of the Crusades, 1000-1300.*

Ithaca, NY: Cornell University Press.

Thematic analysis of warfare during the era, covering everything from the recruitment of troops to the provision of food supplies. Analyses the causes and effects of warfare in political, social and economic contexts.

Jones, Archer. (1987). *The Art of War in the Western World.* Urbana: University of Illinois Press.

Detailed study of the operational and tactical history of warfare in the West. Includes a detailed section pertaining to Medieval warfare, as well as information about the history leading up to the era and the decline of the era.

Keegan, John. (1976). *The Face of Battle.* New York: Viking Press.

Study of military history from the perspective of the individuals in the direct line of duty, without the stylized format of battle descriptions.

Kagay, Donald J. (1999). *The Circle of War in the Middle Ages: Essays on Medieval Military and Naval History.* Woodbridge, Suffolk, UK: Boydell Press.

Ebook: http://www.netlibrary.com/urlapi.asp?action=summary&v=1&bookid=16594

Collection of various scholarly essays covering various topics on warfare in the Middle Ages.

Keen, Maurice Hugh. (1999). *Medieval Warfare: A History.* Oxford: Oxford University Press.

Examination of the experience of war and the developments in the art of warfare.

McNeill, William Hardy. (1982). *The Pursuit of Power.* University of Chicago Press.

WPI Library

Analysis of military, technological and social history since 1000 A.D.

Nicolle, David. (1998). *Medieval Warfare Source Book.* London: Brockhampton Press.

Reference to warfare in Western Europe between 5th and 14th centuries.

Nicholson, Helen. (2004). *Medieval Warfare: Theory and Practice of War in Europe, 300-1500*. New York: Palgrave Macmillan.

WPI Library.

Overview of Medieval Europe, covering the theory of both land and naval warfare, military personnel, buildings and equipment.

Parker, Geoffrey. (2005). *The Cambridge History of Warfare*. Cambridge, UK: Cambridge University Press.

Comprehensive account of war in the West, covering all aspects of military development.

Prestwich, Michael. (1996). *Armies and Warfare in the Middle Ages: the English Experience.* New Haven: Yale University Press.

Examines the development of Medieval warfare, focusing on the English armies. Analyses the ways soldiers were recruited, commanded and supplied, as well as the way armies fought together.

Porter, Pamela. (2000). *Medieval Warfare in Manuscripts.* Toronto: University of Toronto Press. Higgins Armory Museum Library.

Collection of manuscripts explaining military tradition and equipment.

Rogers, Clifford J. (2000). *War Cruel and Sharp: English Strategy Under Edward III, 1327-1360.* Woodbridge, Suffolk, UK: Boydell Press.

Covers the military strategies of the time as practiced by Edward III, who was famous for his ability to military knowledge and ability to force enemies into decisive defeats. Includes accounts of the military campaigns as well as assessment of the strategies in general.

Trim, D. J. B. (2003). *The Chivalric Ethos and the Development of Military Professionalism.* Boston: Brill.Ebook: http://site.ebrary.com/lib/wpi/Doc?id=10089093

Examination of the relationship between the decline of chivalry and the rise of military professionalism in late Medieval and Renaissance Europe.

Wise, Terence. (1976). *Medieval Warfare.* New York : Hastings House.

Higgins Armory Museum Library.

S*urvey of warfare in Europe during the late Middle Ages, including relevant topics such as the military organization of the time as well as all aspects of warfare in general.*

Video Games:

The Creative Assembly. (2006) *Medieval II: Total War.* Sega. www.totalwar.com/en/medieval2

Real-time military battle simulation game set mainly in Europe, North Africa and the Middle East between 1080 and 1530. It gives a very good visualization of the tactics and style of warfare during the age and realistic depiction of all the different soldiers that would be in a typical medieval battlefield.

Contacts:

Forgeng, Jeffrey. jforgeng@wpi.edu.

Curator of Higgins Armory Museum. Project advisor for IQP.

Reed, Bob. jlrr@comcast.net. (613) 598-6813

Does volunteer presentations at Higgins Armory Museum. Bob's group, Wolfe Argent, is at the museum every first Saturday, and I'd recommend that you plan to show up on a first Saturday not later than early A-term to meet them.

An overview of the historical context of war in Europe between 1500 and 1650.

Books:

Arnold, T., & Keegan, J. (2006). *The renaissance at war*.HarperCollins. *Looks specifically at many of the tactical drills and strategies employed by armies after the end of the 15th century.*

Baumgartner, F. J. (1991). *From spear to flintlock: A history of war in europe and the middle east to the french revolution*. University of Michigan. *Should provide a good history of ranged warfare as well as the tactics involved. From the University of Michigan, so it is likely to be reputable.*

Curtis, Edmund. (2008). *Government, War and Society in Medieval Ireland.* Dublin: Four Courts Press. *Collection of twenty essays on the history of late Medieval Ireland by Edmund Curtis, Jocelyn Otway-Ruthven and James Lydon.*

Delbruck, Hans. (1985). *History of the Art of War Within the Framework of Political History.* Westport, Connecticut: Greenwood Press. *Extensive study of the military history of European warfare and the art of war in the greater context of human and social development.*

Hale, John R. (1998). *War and society in renaissance europe*. McGill-Queen's Press. *A book that looks both at the personal impact of conflict, as well as the reformation of the ways in which war was fought.*

Hall, Bert S. (1997). *Weapons and warfare in renaissance europe: Gunpowder, technology and tactics.* Johns Hopkins University Press. A look at the modernization of warfare from the middle ages through the renaissance, with particular emphasis on gunpowder and how it was gradual integrated and dominated the battlefield.

Jones, Archer. (1987). *The Art of War in the Western World.* Urbana: University of Illinois Press. *Detailed study of the operational and tactical history of warfare in the West. Includes a detailed section pertaining to Medieval warfare, as well as information about the history leading up to the era and the decline of the era.*

Lynn, John A. (1990). *Tools of war: Instruments, ideas, and institutions of warfare, 1445-1871*. University of Illinois Press. *Don't know much about this source, though the name sounds very promising and has been cited in the bibliographies of other books.*

McNeill, William H. (1982). *The pursuit of power: Technology, armed force, and society since A.D. 1000*. University of Chicago Press. *Comprehensive, covers over 1000 years of military history. Consistently explains the cause and effect of changes to the drill practices, culture and style of soldiers.*

Murrin, Michael (1994). *History of warfare in renaissance epic*. University of Chicago Press. *Discussion of the public impression of warfare at the time, analyzing multiple sources from a variety of areas in Europe.*

Oman, Charles William Chadwick. (1987). *A History of the Art of War in the Sixteenth Century.* London: Greenhill. Higgins Armory Museum Library. *Very detailed account of 16th century warfare with detailed descriptions of individual campaigns in addition to maps illustrating the geographic context of the battles.*

Parker, Geoffrey (2005). *The cambridge history of warfare*. Cambridge University Press. *This text is organized by time period, and will be able to pinpoint the development and modernization of cavalry as a counteraction to general infantry. Being from Cambridge University, it should be a reputable source.*

Parker, Geoffrey. (1988). *The Military Revolution: Military Innovation and the Rise of the West, 1500-1800.* Cambridge, England: Cambridge University Press. WPI Library. *Detailed account of the development of Western military technology leading to the dominance of the West on the world stage. Covers the complete transformation of warfare as a result of technological change.*

Porter, Pamela. (2000). *Medieval Warfare in Manuscripts.* Toronto: University of Toronto Press. Higgins Armory Museum Library. *Collection of manuscripts explaining military tradition and equipment.*

Tallett, Frank (1997). *War and society in early-modern europe, 1495-1715*. Routledge. *Pulls from many regions in Europe to analyze why large armies were raised, and the social, economic and political results.*

Tracy, James D. (2002). *Emperor Charles V, Impresario of War: Campaign Strategy, International Finance and Domestic Politics.* Cambridge, UK: Cambridge University Press. *In-depth exploration of the military, political and economic aspects of the campaigns of Emperor Charles V, ruler of the Holy Roman Empire during the early 16th century. Tracy examines archives from all relevant countries as well as contemporary research.*

Trim, D. J. B. (2003). *The Chivalric Ethos and the Development of Military Professionalism.* Boston: Brill. Ebook: http://site.ebrary.com/lib/wpi/Doc?id=10089093 *Examination of the relationship between the decline of chivalry and the rise of military professionalism in late Medieval and Renaissance Europe.* Wagner, Eduard (1979). *European weapons and warfare, 1618-1648*. Octopus Books. *Little is said about the book online, though by the title it seems to fit perfectly into the theme and correct timeframe.*

Wise, Terence. (1976). *Medieval Warfare.* New York : Hastings House. Higgins Armory Museum Library. S*urvey of warfare in Europe during the late Middle Ages, including relevant topics such as the military organization of the time as well as all aspects of warfare in general.*

Articles:

Bachrach, Bernard S. (1994). Medieval Siege Warfare: A Reconnaissance. *The Journal of Military History, 58(1).* http://www.jstor.org/stable/2944182 *Detailed account of the use of siege weaponry and the tactics revolving around them. Bachrach goes into detail covering the tactics around defending against siege weapons as well as using them in attacks against fortifications.*

Contacts:

Forgeng, Jeffrey. jforgeng@wpi.edu. (508)-831-5442.

Kenworthy, Paul. mesketet@tiac.net. (781) 231-5988. *Works with a group that does reenactments and specializes in 17th century pike drills. Also performs at the armory.*

Weapons of the Medieval Era: The Quarterstaff and Halberd

Sources:

Anglo, Sidney (2000). *The martial arts of Renaissance Europe*. New Haven, CT: Yale University Press.

An in-depth look at martial arts throughout Europe from the fifteenth to seventeenth century, dealing with the combat of knights, soldiers, and the common man.

Brown, Rodney H (1967). *American polearms, 1526-1865*. New Milford, Conn: N. Flayderman.

Discusses the use of polearms in the Americas from their use by Native Americans and Vikings through the Civil War.

Buehr, Walter (1963). *Warriors' weapons*. New York, NY: Crowell.

Discusses the evolution of weapons from the stone age through the feudal age. Included in the topics is the evolution of the halberd.

Di Grassi, Giacomo (1594). True arte of defence. London, England.

Di Grassi's text includes a chapter on tactics and techniques pertaining to pole weapons such as the halberd, pike and bill.

Edge, David, Paddock John M (1988). *Arms & armor of the medieval knight*. New York, NY: Crescent Books.

You placed this book on the list of books for me to look into, and while I have found nothing to suggest that there is nothing on either the Halberd or Quarterstaff in it (as knights did use the Quarterstaff to train with), I have at the same time found nothing to suggest that either are detailed within this book. It may, however, prove to be useful in other fields of this project.

Falkner, Peter (late 1400s). *Fechtbuch*. [Manuscript]. Vienna, Kunsthistorisches Museum P 5012

Suggested by Professor Forgeng for this list, this work includes the quarterstaff in its weapons.

Forgeng, Jeffry & Kiermayer, Alex (2007). *'The Chivarlic Art': German martial arts treatises of the Middle Ages and Renaissance*.

This piece deals with the combat manuals themselves, and their authors and the context in which they were written.

Forgeng, Jeffry (2008). Virtual Exhibitions. Retrieved April 28, 2009, from Higgins Armory Museum Web site: http://users.wpi.edu/~jforgeng/CollectionIQP/searchform.pl

This database allows us to search the artifacts in the HAM and allows us to view photographs of most items within.

Gilchrist, Christopher British Quarterstaff Association. Retrieved April 14, 2009, from British Quarterstaff Association Web site: http://www.quarterstaff.org

A modern organization dedicated towards training people in how to use the quarterstaff. Included on their site are several videos showing different fighting sequences.

Gilkerson, William (1991). *Boarders away, with steel : the edged weapons and polearms of the classical age of fighting sail, 1626-1826, tracing their development in the navies of England and northern Europe through that of the United States*. Lincoln, RI: USS Constitution Museum

While this does place some emphasis on their use in the United States, this does include the use of polearms in Europe towards the end of the period which we are researching.

Lindholm, David (2006). *Fighting with the quarterstaff: a modern study of renaissance techunique*. Highland Village, Texas: Chivalry Bookshelf.

A synthesized guidebook incorporating the works Meyer and several other fighting masters designed for both novices and the experienced, with photographs and step-by-step guides to each technique.

Mair, Paulus H. (c. 1555). *Treatise on the martial arts*.

Mair's treatise includes 20 techniques each for the halberd and quarterstaff.

Meyer, J (translated by Forgeng, J. L.) (2006). *The art of combat: a german martial arts treatise of 1570*.New York: Palgrave Macmillan.

Meyer's manual includes a chapter on polearms.

Miller, James (1737). *A treatise on backsword, sword, buckler, sword and dagger, sword and great gauntlet, falchon, quarterstaff.* London, England

While old, this book contains a section on the quarterstaff.

Montross, Lynn (1960). *War through the ages*. New York, NY: Harper.

Paurenfeindt, Andre (1516). *Ergrundung ritterlicher Kunst der Fechterey*. Vienna: Hieronymus Vetor.

Suggested by Professor Forgeng for this list, this work includes the quarterstaff in its weapons.

Phillips-Wolley, C (1920). *Broad-sword and single-stick*. London, England: G. Bell & Sons.

While this book does contain sections on the use of the quarterstaff, it also contains details on fighting with other commonly found weapons, such as the shillalah, cudgel, and even the umbrella.

Riboni, Giuseppe (1862). *Broadsword and quarter-staff without a master*. Chicago, Illinois: E.B. Myers.

A discussion of more modern (relatively speaking) forms of fencing and quarterstaff-use in Europe and the United States.

Silver, George (1599). Paradoxes of Defence. Retrieved April 28, 2009, from Paradoxes of Defence Web site: http://www.pbm.com/~lindahl/paradoxes.html

In this manual Silver discusses both the theory behind and drawbacks to fighting with weapons including the halberd, pike, and shortstaff.

Silver, George (1898). Brief Instructions Upon My Paradoxes of Defense. Retrieved April 28, 2009, from Brief Instructions Upon My Paradoxes of Defense Web site: http://www.pbm.com/~lindahl/brief.html

An additional manual by Silver, this recounts additional techniques for the short and long staff, as well as the bill and pike.

Snook, George (1998). *The halberd and other European pole arms, 1300-1650*. Bloomfield, ON: Museum Restoration Service.

Discusses the use and development of the halberd throughout history, among other weapons.

Swetnam, Joseph (1617). The Noble Science of Defense. Retrieved April 28, 2009, from The Schoole of Defence Web site: http://myweb.tiscali.co.uk/schooleofdefence/swetnam.PDF

Swetnam's training manual includes a section instructing on the use of both the quarterstaff and pike.

Wagner, Paul (2003). *Master of Defense: The Works of George Silver*. Boulder, Colorado: Paladin Press.

A Modern Synthesis of both of George Silver's works, Paradoxes of Defense and Brief Instructions upon my Paradoxes of Defense, which include details on fighting with the halberd and short staff.

Waite, Adrian (2001). *Medieval pole weapons 1287-1513 : the untold story of the medieval billman and his polearm*. Bristol, England: Stuart Press.

Discusses the average infantryman and his weapons.

Waldman, John (2005). *Hafted weapons in medieval and Renaissance Europe : the evolution of European staff weapons between 1200 and 1650*. Boston, MA: Brill.

Discusses the typology, use and forging techniques of several different staff weapons throughout the medieval and renaissance periods.

Wylde, Zachary (1711). *The English Master of Defence*. York: John White.

Among several other types of weapons, this manual includes a section on Quarterstaffs, explaining several moves and techniques for it. Found at the Met in NYC and online.

Contacts:

Gregory, Mike mahgregory@yahoo.com.

Martial arts teacher since 1973, familiarity with a variety of staff forms, including French baton.

Kenworthy, Paul mesketet@tiac.net, (781) 231-5988

Member of a volunteer group who work with at 17th century pike drills at the Armory.

Reed, Bob. jlrr@comcast.net. (613) 598-6813

Does volunteer presentations at Higgins Armory Museum. Bob's group, Wolfe Argent, is at the museum every first Saturday.

Waldman, John halberdjw@comcast.net

Author of “Hafted Weapons...” listed above.

Appendix 1: Staff Handbook

Introduction

The goal of this demonstration to the museum is to show visitors just how important pike drills and fighting tactics were to war and society of the 1400s. Not only is the hope that the patrons have a fun and educational experience, but also that they experience and understand how those changes in warfare affect them today (i.e. how pikes evolved into bayonets and pike men proved that ordinary men could be employed effectively on the battlefield against trained knights and professional soldiers).

Background

It was at this time that the power of war was moved from the aristocracy and nobility to the commoner. In the civilian world it was a time of renewed art and culture, a renaissance; on the battlefield it was the time where the common man could defeat the knight in battle. Where previously land was dominated by nobility that also fought and won wars, the new trend was for the poorer classes to fight and die. In the abstract sense, this means that average citizen is viscerally involved in war and may gain a sense of nationalism and identity. Many strong nations developed around democracy can trace their roots to a lower class that can defend themselves and win their autonomy. Switzerland was one of the first examples, and it was of course followed by many other nations and The United States as well. The U.S. as well as many other nations today have adopted this method idea of being able to train soldiers from raw recruit to “boots on the ground” combat ready in relatively short time periods.

What also sets the target time period apart from previous wars was the beginning of what could be described as a combined arms military. Modern militaries require a coordinated effort among branches, divisions and individual soldiers that can trace its roots to the 1400s and the beginning of combined arms. This job specialization is also similar in concept to the beginning of the industrial revolution. Without this concept of each member having a role that can contribute to the ultimate goal the modern world would not be as advanced. This idea is carried over into the industrial era where the assembly line to the concept to heart, each worker produced a part and each part contributed to the whole, and at the same time parts were interchangeable and dispensable.

The drills taught in this demonstration are also symbolic of an economic change in warfare. Where the fully-armored knight was once the prized fighter in any army, it changed to cheaply outfitting many soldiers and training them to fight together. This shift was crucial, as it started a trend of trading off between expense versus quality of soldiers. Armies grew vastly in numbers in the following century, largely because recruiting and training commoners to fight with pikes was less expensive than a single fully armored knight would be.

The outcomes from the particular point in history the demonstration focuses on are very diverse. Together they make the demonstration representative of an important juncture in history. The hope is that these facets of the background surrounding the drill can be represented to the general audience so that they may understand its significance.

Document Objectives

The purpose of this document is to provide performers of the Interactive Pike Demonstration with the necessary background information to become adequately prepared to both run the presentation and field any questions that may come up during or after the presentation. Also, it will prepare presenters with all information they will need to understand the specifics behind the presentation and the details therein.

We will begin by looking into the vocabulary needed in order to be comfortable in talking about and putting on this demonstration. From there, we will move to guidelines for the presentation itself and then details on each major part of the presentation. Once that is done, Auxiliary Materials will be covered, including the Historical Context of the time period, Preparatory Activities for school groups before the presentation, and then Post-visit materials, for useful information people who have already seen the presentation. Finally, some Auxiliary Information for the demonstrators themselves, including a Contact List of people knowledgeable on the subject. There is also a staff guide attached to the hand book which can work as a standalone document. Its intended purpose is to be separated from this document and used as a quick reference for presenters about to put on a performance so as to refresh their memories.

Presenter's Guide

Title

Join a Medieval Army!

Objective/core unifying concept

Few people in today's world understand the core concepts behind medieval battle. Participants should get a sense of what it was like to take part in a medieval military drill, as well as participate in a mock battle. They should also become aware of the differences between the common foot soldier and the fully armored and trained knight. Additionally, the hope of this demonstration is to show the audience through active participation the difficulty of maintaining an effective fighting unit in medieval times.

3 Main Ideas

- **Universal truth:** The importance of teamwork and coordination to military organization in general
- **Connections to the Present:** Many of the medieval soldiers joined the military for the same reasons as modern soldiers: money, patriotism and adventure
- **Historical Context:** Over time, foot soldiers began to replace the knight as the primary unit of battle in medieval and Renaissance warfare.

Strategic Goals

- To spark and maintain an interest in medieval warfare with existing and potential museum visitors.
- Provide a quality in-house presentation that can stand alone/integrate with other armory presentations concerning halberd and pike drills.
- Connection to Middle Ages
- Connection to collection
- Use of existing resources

Blurb

Ever wonder what it was like to be a medieval soldier? Well now you can find out! Experience history coming to life around you in the Higgins Armory Great Hall; meet and

chat with live medieval soldiers; train with your friends and family in a real pike formation. Meet the soldiers who eventually replaced and defeated the noble knight.

Format

Roleplay, hands-on, Costumed living history

Audience

General public, participation in interactive portion optional

Personnel

- An absolute minimum of 2 is possible, but recommended with 3 to 4.
- 8-20 audience members, to be accommodated based on the equipment and space constraints

Performance space

Central area of the great hall, or area of similar size: 25’ x 35’ (with 15’ of head room)

Equipment

- Costumes for performers
    - Tips for costuming are in Staff Handbook
- A fake halberd for each performer
- The Crossbow for the mock battle
- Fake halberds of varied size, enough for the expected audience
- Current Inventory (according to inventory list):
    - 2 Long Leather Halberds
    - 11 Short Leather Halberds
    - 2 Wooden Halberds
    - 2 Wooden Poleaxes
    - 4 Long Staves
    - 3 Short Staves
    - 6 Children’s Halberds

Time

1. Intro: 1 Minute
2. Body: 15 Minutes
    - Distribute Weapons: 1 Minute
    - Equipment: 3 Minutes
    - Positions: 5 Minutes
    - Tactics and Units: 2 Minutes
    - Mock Battle: 3 Minutes
    - Collect Weapons: 1 Minute
3. Conclusion: 1 Minute
4. Question & Answer: Up to 10 minutes

Introduction

Hello and welcome to the year 1486. I take it from your presence that you want to join a medieval army. I mean, we've all heard stories about the knights, right? King Arthur, Lancelot, the Templars, all heroic and romantic figures. But people like you and me can't be knights - that process is reserved for nobles, and the training takes years. But at this point in time, knights no longer own the battlefield. It is at this time that they are being supplanted by people like you and me - the footsoldier. Today, we will be training you in the forms of the pikemen, one of the most common units of the medieval military.

So everyone here willing and able to fight has been recruited in our army. Congratulations! Please step towards the center of the room and receive your equipment. For everyone else, feel free to watch. *[Take a moment to go around room cajoling and convincing people to join in and take part. Particularly the adults, as their joining will encourage others to join.]*

Presentation Outline

1. Distribute Weapons
    - All of the participants will be getting halberd/pikes.
    - The crossbow should be handed to the presenter who will be doing the Mock Battle
    - The participants should be around 4 to 6 a line, going back 2 to 4 lines.
    - They should initially be placed under the balcony, nearer to the doorway

- At this point, presenters are still focal point.

2. Equipment
   - Why are we using Halberds and not Pikes?
     - Pikes are too long (from 15 to 24 feet), which would interfere with the both the ceiling and the chandelier
       - A good example of an actual size pike can be seen at the west end of the Great Hall.
     - Halberd size (normally around feet) makes it easier to handle.
       - Several examples are visible nearby displayed on walls
   - Other Weapons
     - Sword (Approximately 3' long)
     - Much could be produced inexpensively
   - Armor
     - Mail: Armor made entirely of tens of thousands of tiny interwoven metal rings
     - Plate armor: Armor made up of large sections of metal plates
     - Head coverings: Typically a metal helmet.
     - Little or no armor for legs, allows for mobility
   - Differences between Knights and Pike men's Equipment
     - Weapons:
       - Knights carried a much more diverse array of weaponry than pike men:
         - Mounted: Typically a lance or some sort of short pole arm such as a pole axe.
         - Dismounted: long swords, halberd, pole axes, and/or maces
         - Also a knight almost always had a dagger as a sidearm.
     - Armor:
       - Knights much more heavily armored than pike men, often they wore heavy plate armor, encasing their entire body in a protective shield. Below this armor would often be chain mail and leather. During battle if the armor became too cumbersome they would often remove parts of it in the field.

3. Positions

- *One presenter explains; the other presenters actually do the positioning (in the front) as a model for the audience.*
    - Recommended order for first run through of positions:
        - Order
        - Advance
        - Port
        - Charge
        - Port
        - Advance
        - Order
        - On your knees

4. Tactics and Units
    - Comment on the wide variety of weaponry used throughout the Middle Ages
        - Talk of the three main types of soldier (Bowmen, pikemen, cavalry)
        - Explain that each had their own strengths and weaknesses
    - Explain how the pike men were effective against cavalry
        - Wall of pikes was deterrent to horsemen
        - Threat of having gaps in pike ranks
    - Explain how cavalry were effective against bowmen
        - Lightly armored
        - Not well suited to physical combat
        - Relied upon fellow pikemen to provide them with protection
    - Explain how the bowmen were effective against pike men
        - Able to attack from a distance
        - Pikemen were typically close together, were an easy target
5. Mock Battle
    - Participants and presenters should switch and
        - Participants should now stand where the presenters were standing
        - The presenters should now be standing where the participants were standing
        - The focal point at this time is now the participants, not the presenters
    - “Army” is put into ranks
        - Front line – On Your Knees

    - Back Line – Pikes to Charge
    - Any and All Middle Lines – Pikes to Port
- Go through "killing" of soldiers and follow with the responsibility of other soldiers in replacing them
- Presenter with Crossbow stands in front
    - He's the enemy army, and is going to be killing the front line
    - As this is "make believe" the killed soldier moves to the back row, and goes to charge
    - Everyone else in the line moves up one to fill the gap and take the appropriate position
- The rest of the presenters should join the army; at least one presenter should be in each rank at all times

6. Collect Weapons

Conclusion

<u>If this is not a school group presentation:</u>

So, with enough practice you folks together could easily become better soldiers than any knight could have been. Sure, a knight may have the best armor and years of training. What you all have though is *cooperation*. Having soldiers at your side that you can trust to be ready for anything because they have prepared for it, you can be sure to work together to survive using what you have learned today. Thank you all for participating and we hope you enjoyed yourselves. We will hang out and answer any questions you may have, so please feel free to come by. Otherwise, thank you again for joining us and enjoy the rest of your experience at the Higgins Armory.

<u>If the audience appears to be primarily school groups:</u>

So, with enough practice you folks together could easily become better soldiers than any knight could have been. Sure, a knight may have the best armor and years of training. What you all have though is *cooperation*. Having soldiers at your side that you can trust to be ready for anything because they have prepared for it, you can be sure to work together to survive using what you have learned today.

Hand out auxiliary papers. These papers will provide additional information.

For those who are interested in learning more, please check out these exhibits: *(Insert list of exhibits and directions to them).* You can also learn more online at the link provided in the handouts. We will hang out and answer any questions you may have, so please feel free to come by. Otherwise, thank you again for joining us and enjoy the rest of your experience at the Higgins Armory.

Background Material

Guidelines for Presenters

Preparation and Setup

- Public presenters should either be set up to be accessible for visitors, or in an "offstage" area.
- If this is done in the Great Hall, the benches there should be moved perpendicular to the center area to both create a small central "stage" area and a place for people to sit and watch.
- Be sure to give yourself ample time to dress in the necessary costumes before starting the presentation.
- There should be no metal weapons in the ranks at any time, for safety.
- Don't scare audience/participants by getting too close to them with the metal weapons – stick to the wooden ones for moving around.

Speech

- Speak slower and louder than you think you need too – especially if there's a large crowd. If you are so slow and loud that it sounds silly to you, you're probably doing it right.
- Don't wear a helmet while talking (but it may be a good idea for the performer acting as the enemy army "killing" this army to wear one).
- Don't be afraid to repeat yourself.

Things to keep in mind during presentation

- Relate to and build on knowledge people already know (fairy tales etc).
- If there are few volunteers, try to pull them from the audience (pick them out and ask them to come up). Some people may be too shy to come forward; if someone says no when you directly ask them, just move on.
- Intersperse costumed performers so that one is on each rank (as an exemplar for each different position).
- Put people into rank and file before explaining the positions, but rotate the entire presentation 180 degrees for the battle, so the "army" is the focal point.

- Keep an eye on any little kids who may be over excited or need help every step of the way – if so, slow down the presentation and make sure they get it right.
- Be familiar with supporting information in case audience members have questions.
- Don't forget the non-participating audience
- For safety reasons, keep the audience away from the metal weapons
- Slow down when doing the pike positions, some people take some time to get into formation

Classic example of 1400's attire

Costuming Necessary for Presenters

- Need to have shirt/tunic
- Hood or headgear is highly desirable, as it is a focal point for how the audience perceives you
- Black sweatpants can be substituted for leggings if those of a suitable size can't be found
- Authentic shoes are preferable, but any unobtrusive dark shoes are ok in a pinch.
- Helpful note: wear light clothes underneath your costume – they get very hot, and don't breathe
- Contact the Higgins Armory Education Department for costume supplies

Presentation Details

These topics are the background material that is necessary for the presentation. For a high-level overview of the outline of the presentation and its flow, refer to the *Staff Guide.*

Pike Men's Equipment (Mid 15th Century):

- Weapons
  - A Pike
  - A Sword
- Armor
  - A Sallet
  - Both Mail and Plate armor
  - Relatively light armor on the legs for mobility
  - Note: Those pike men near the front of the line would be much more heavily armored than those further back.

Reference Guide of Pike/Halberd Positions

Images taken from *The Renaissance Drill Book.* This book, first published in Dutch by Jacob deGheyn in 1607, is used because it is the earliest surviving account of how these maneuvers were performed.

Pikes to Order
•Right foot slightly in front of the left foot with the pike held in the right hand perpendicular to the ground.
•Very casual position, good for standing still (at guard, for example).
•From Advance: Grab Pike with left hand. Take right hand and grab pike as high up as possible. Release left hand, lower pike to ground.

The pike ordered

Advance Pikes
•From Order: Lift pike up with right hand. Grab pike with left hand, move right hand so that it is "cupping" the bottom of the pike, curl right arm around pike so it's holding on to it. Release left hand.
•Pikes should stay vertical.
•From this position people can move around without hitting each other.

The pike advanced

Pikes to Port
•From Advance. Take a step back with right foot. Grab pike with left hand. Adjust pike so right hand is slightly below and behind the waist, and left forearm is at level of elbow and parallel to ground. The pike should be at roughly 45 degrees to the ground.
•Useful for marching beneath anything

Port your pike (the second motion)

Charge your Pike
•From Port: Bring right arm up so that pike is parallel to ground. Move right arm back so it is extended as far back as possible, still cupping the bottom of the pike. Left hand should form a fist around the pike, and be at wielder's cheek, with back of the hand facing away. If there is a person behind, the wielders right hand (cupping the pike) should be against the left shoulder.
•Useful for fighting other groups of infantry in battle

Charge your pike

Note: Image does not match description because, still no documentation on "on your knee"

On Your Knees (Prepare for Cavalry)
•From Order: Move all lines closer together so they are shoulder to shoulder. Then, step forward with the left foot and go down on the right knee. The butt of the pike should rest against the ground and the knee, held up by the left hand, the left elbow should be resting on the left knee. The pike should be held, Pike port, at around 45 degrees. The right hand should remain free (if possible) to potentially draw a sword.

Charge your pike for horse and draw your sword

Equipment Example Script:

"As some of you who know your medieval weapons history may already have noticed, we are not holding pikes. Instead we're holding halberds. Now there is a very good reason for this; on average a pike ranges from 15 and 24 feet in length. If you'll look above you, you'll see a pretty nice chandelier that we really would like to keep, and so we have to use halberds for this demo."

"The halberd allows the common folk (especially in Switzerland) to stand up against trained knights and directly contributes to the downfall of the feudal system and the knights replacement by the professional soldier. The pike is used as a weapon for infantry up to the 1700s, both in Europe and the American Colonies.

"A pikeman's weapons are relatively simple; he carries a pike as his main weapon, and as a sidearm a sword, usually around 3 feet in length."
"The pikeman's armor is determined largely by the country in which he lives. In some countries the government might provide his armor, or in others he may have to provide for himself. For example the most potent of all medieval pikemen, the Swiss pikes, are equipped largely by the Swiss government. A Swiss pikeman typically wears a breast plate, back plate, and a helmet. Beneath that is usually mail and leather. As one goes further back in a Swiss pike block the soldiers are more lightly armored, often just wearing mail, or even just leather. Regardless of position pikemen wear little or no leg protection to preserve mobility."

Knights differences

"Well now that we know the pikeman, let's take a look at his enemy. The person the pikeman is most often used against is the knight. A knight's weapons are much more diverse than a pikeman. Depending on if he is mounted or on foot he could carry an arsenal of different weapons. Two of the most classic examples are the long sword and lance, they could also carry a pollaxe, or mace"
"Now as for what a knight wears for armor, one only has to look around this room to get an idea for the kinds of things he wears. Typically a knight will be covered in heavy plate armor, like the armor over there. Below that he could have mail and leather, covering his body in a protective shield."

Strategies and Tactics Example Script

"Looking around you today, you can see that there are a wide variety of weapons that warriors can employ in medieval battle. However, most soldiers fit into one of three categories: there are close-combat footsoldiers like you and I, there are bowmen and crossbowmen like this soldier here [*gesture to presenter holding reproduction crossbow*], and there are the cavalry as you can see on the models here in the hall. Each of them has their own strengths and weaknesses, and reasons for being on the battlefield.

For instance, we pikemen are superb fighters against the cavalry. When in formation, the wall of pike points we create are easily enough to deter horsemen from wanting to attack.

We have to be careful though, as if there is any gap in our ranks, there is the possibility that a horseman may get through and attack us with little hope of defending ourselves.

On the other hand, the cavalry has the advantage against the bowmen, who are lightly armored and little threat to the armored and charging cavalry. Because of this, it is common for pikemen to be positioned in front of bowmen to offer a buffer zone to keep the cavalry away.

Lastly, bowmen are a particular threat to the pikemen. Being so close together in formation and not especially well armored, we are an easy target for the enemy bowmen. For this reason, we are going to see how you all fare in the face of just such a threat."

Mock Battle

One of the purposes of the Mock Battle is to give the participants a sense of what it's like to be in formation with a group of people and under pressure to position themselves correctly, not only for their sake but for the sake of the entire group.

The basic idea of the mock battle is that the group is an army of pikemen up against another army, this one with archers and cavalry. The bows are able to take out the front line, which would free up space for the cavalry to charge in and take out the group.

To ensure that this doesn't happen, the group must maintain a solid front wall of pikemen on their knees (prepared for cavalry). Behind them should be people in charge, and the rest should be at port (preparing to go to charge). If a person in the front line falls, those behind (in order to maintain a solid wall to protect all of them against the cavalry) must move forward, changing positions as needed. The person killed (as this is make-believe) should after their death pick up their weapon and move to the back of their file, ready to move forward when someone else is killed.

According to Bob Reed (head of the Wolf Argent, see Contacts below), there are few primary documents from the period – the actual occurrence of people moving forward in file is not documented in any one location. He explained, however, that doing this is common sense in order to maintain a good defense against cavalry, and that the Roman military manual *De Re Military* by Vegetius suggests this technique.

Example Script

So now everyone has their equipment, you all know how to use it, and you know what your purpose is combat. Let's see how you do in battle! There are [insert number of

participants] here, but image if that your whole mass was ten men in a line with five men behind – a total of fifty pike men, with just as many bowmen behind – a total of one hundred men, a typical small operational force on a medieval battlefield. You're all standing on huge, flat field, and off in the distance – an enemy army.

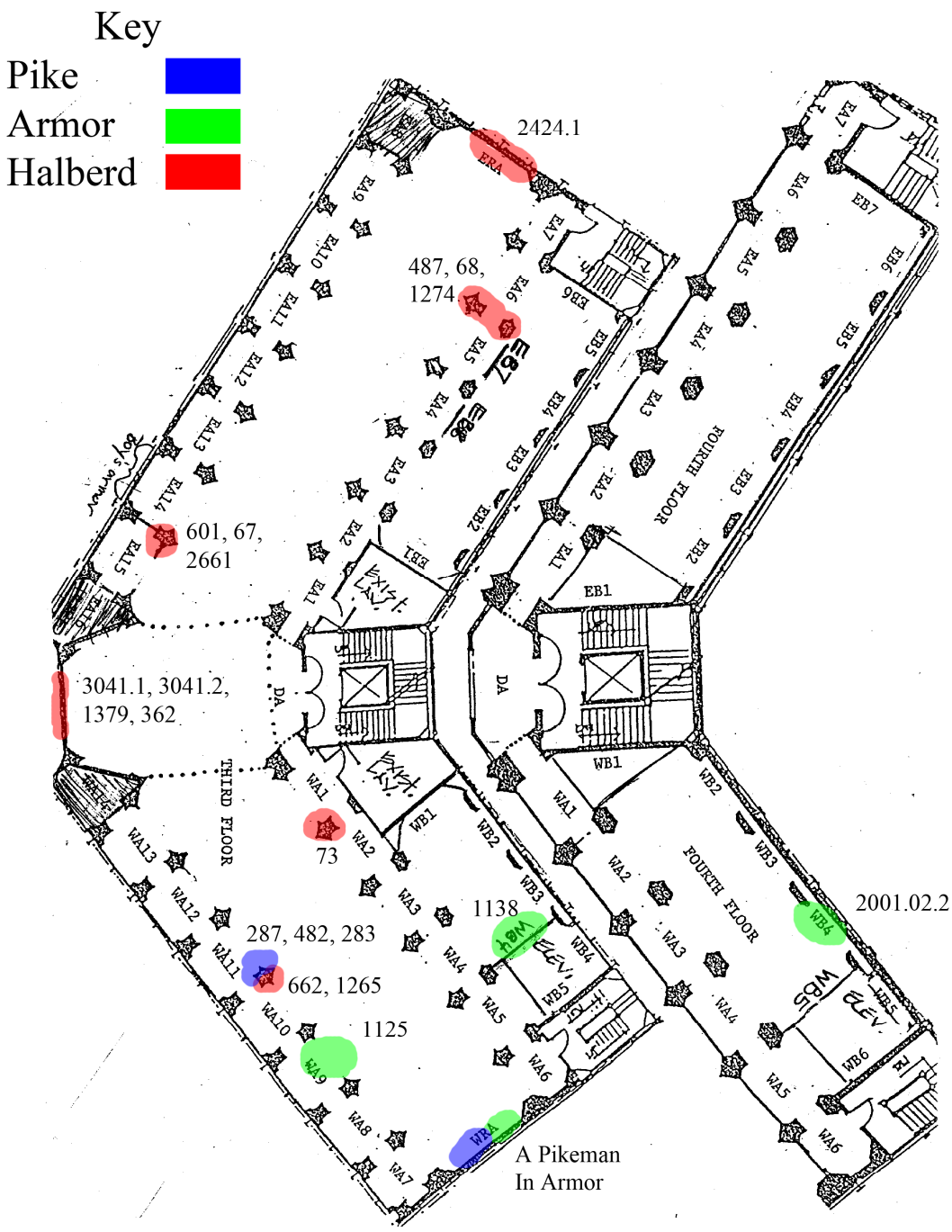
This army, however, is made of cavalry and crossbowmen. Now, those cavalry are going to try to break into your pike line to take out you and your friends, so you need to make sure that your pike wall remains solid. The crossbowmen are going to be firing at your front line, and trust me; they're going to take some of you out. When that happens, you need to fill that hole in – fast. The people behind are going to move forward and take the appropriate positions. Because this is make-believe, the person who was killed will get up and go to the back of the line. The front line will be "On Your Knees" to prepare for the cavalry, the row behind should be at "Charge," and everyone else will be at "Port."

So, I am the enemy army. I will be taking you out, one by one. Let's see if you can keep up.

[Go through Battle. When everyone has gone through the entire cycle at least once, continue]

So, while you all have been busy defending them, the bowmen behind you have been slowly but surely taking out the enemy. They've been defeated! Congratulations, you've survived your first battle!

Map of Museum with Relevant Artifacts Listed



Auxiliary Information for the Demonstrators

- Video documentation of the presentation
- Photographs of the pike formations

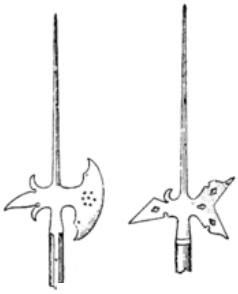
List of contact references

- Bob Reed, jlrr@comcast.net, (603) 598-6813
    - "Is in charge of Wolfe Argent, a group of re-enactors that often perform at the Armory on the first Saturday of each month. Bob is an expert in many facets of Medieval and Renaissance warfare."
- Paul Kenworthy, mesketet@tiac.net, (781) 231-5988
    - "Paul's group (The Higgins Amory Sword Guild) do pike drills from the 1600's, performances at the Armory are less regular. Another strong expert on warfare."
- Jeffrey L. Forgeng, jforgeng@wpi.edu,
    - "Curator at the Armory, Jeffrey is familiar with a wide variety of topics. He also personally knows all demonstrators, and has experience demonstrating himself."
- Devon Kurtz, Dkurtz@higgins.org,
    - "Director of Education at the Armory. Excellent source for working on developing demonstrations and acquiring resources necessary for them."

Pre-visit Materials

Vocabulary

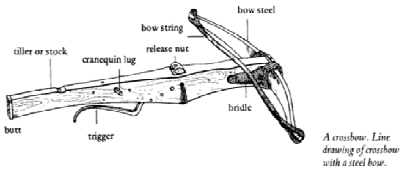
- **Rank** – a row of soldiers
- **File** – a column of soldiers
- **Staff Weapons**
  - **Halberd** – staff weapon around 6 to 8 feet long, commonly with a front axe blade, top spike and reverse hook
    - Halberdier – Someone who fights with a halberd
  - **Pike** – a two-handed derivation of the spear (15 to 24 feet) used extensively by medieval and Renaissance footmen
    - Swiss pikemen- The most formidably trained mercenary soldiers to use pikes



Halberds

Pike

- **Time Periods**
  - **Middle Ages/Medieval Period** – Period of European History from about 400 AD to 1450 AD
  - **Renaissance** – Period of European History from about 1450 AD to 1650 AD
- **Bows:**
  - **Crossbow** - A mechanical bow operated by a release mechanism.
  - **Longbow** - A type of bow that is roughly equal in length to the height of the person wielding it. It could fire at enormous range with significant stopping power. It was made famous by the English longbowmen.
  - **Shortbow** - A composite bow, normally made in three pieces: a center part and two wings. The shape is formed over pieces of wood. To these is glued horn on one side, and sinew on



A crossbow. Line drawing of crossbow with a steel bow.

Crossbow

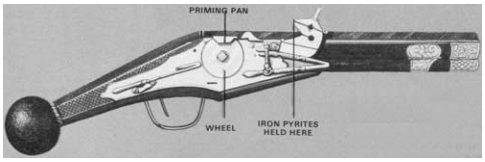
Musket in use

Muskets in use

the other. The bow has enormous power considering its size.

- **Firearm** – A mechanism that uses controlled explosions to fire projectiles
  - **Arquebus** –firearm used during the Renaissance
    - Smooth-bore (No rifling to make it fly straight)
    - Typically used on battlefield
    - Lighter version of musket
  - **Musket –**firearm, typically heavier than the arquebus
    - Smooth-bore (No rifling to make it fly straight)
    - Typically used in defensive forts
    - Heavier than arquebus
  - **Gunpowder** - Explosive mixture of sulfur, charcoal, and saltpeter used in firearms
    - Ratio in mixture varied by time and location
    - Quickly became useless when wet
  - **Matchlock** – Mechanism that used a slowly burning flame that was pressed into the gunpowder pan to fire the weapon
    - First appears in the 1400s
    - Earliest mechanism used to fire a firearm
    - Unreliable, could go out or not ignite
    - Dangerous, had lit flame near gunpowder

Matchlock



Wheel-lock

  - **Wheel-lock** – Innovation that improved firearms, making them easier to fire and more reliable
    - First appears around 1550
    - Relies on mechanism similar to cigarette lighter wheel
    - Very complicated, difficult and expensive to produce
  - **Flintlock** - Improvement upon matchlock and wheel lock
    - First appears around 1630
    - Most reliable of any previous mechanism
    - Uses striking of flint to ignite pan of gunpowder

Flintlock

        - Cheap to produce
        - Safe, no flames used
- **Mercenary** – Someone hired by a nation or general to fight for them in battle.
    - **Landsknecht** – One of the most successful and desired band of mercenaries, based in present-day Germany
- **Infantry** – soldiers who travel and fight on foot
- **Cavalry** – Soldiers who fight on horseback
- **Armor**
    - **Mail** - A shirt composed entirely of tiny interwoven metal rings as a form of armor
    - **Soft Armor** - Light protective armor typically made of leather, or thick cloth; cheapest form of armor at the time

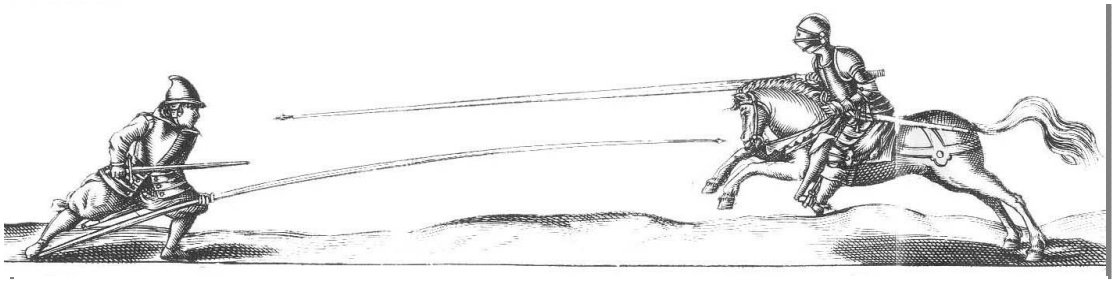

Chain Mail shirt

- **Flanking** - A maneuver in battle where one positions troops so as to attack their opponent's sides

FAQ's

- Q: Why were the pikes so long?
    - A: The pike's length grew over time in history, and one of the biggest advantages to having longer pikes was that when all the soldiers were in position and charged their pikes, there would be 4 to 5 rows of pikes to get past before reaching the front line of soldiers. This overlapping of pikes created a strong barrier to keep the unit of soldiers protected.
    - A: Another advantage to the length was to give the pikemen a way to overcome the length of a horsemen's lance. The lance at the time would typically have been around 10-12 feet in length, while in comparison the pike would have been around s17 feet on average. Even when in a lunge position supporting the pike, the tip would still be 13-14 feet in front of the soldier, giving him a few feet advantage in striking the enemy or his horse first. [*An example of this is best illustrated below*]

- http://users.wpi.edu/~jforgeng/Modeling_the_Joust.pdf



- Q: What could an enemy do to defeat a division of pikemen?
  - A: One tactic that worked was to fire on them with bowmen and crossbowmen. Being so closely packed together in formation, they were an easy target. Once they were weakened, if there were any gaps in their formation then they were an easy target for the cavalry.
  - A: Another way they could defeat them was they would sometimes use specially trained soldiers with very long swords who would try to cut their way through the center of the pikemen. It was a very dangerous job, and many times would be done by prisoners hoping to gain their freedom, if they lived.
- Q: How were the pikes made?
  - A: One of the best places to get the long, straight wood for the pike was from the sapling shoots of an ash tree. They would grow very straight and have no branches, and were ideal for producing pikes
- Q: How much did the pikes weigh?
  - A: An average pike weighed only around 9 pounds, but was tapered towards the end and weighted so that it would be able to be handled easily with a bit of practice.
- Q: What was “Port” used for?
  - A: There’s a myth that it refers to lowering the pike to get it through the gate or “port” of a fortification. In reality, this position gets the pike ready for the charge, without going into the more tiring charge position, or slowing down the pace (since soldiers at the charge move more slowly). It also keeps guys in the rear ranks from stabbing their friends up in front.

Framework connections

- Medieval history studies
- Any type of schoolwork emphasizing communication, teamwork and coordination
- Comparison of medieval soldiers to modern soldiers
- Mass. curriculum framework connections

THE Medieval Period in Europe to 1500

WHI.7 Describe the major economic, social, and political developments that took place in medieval Europe. (H, E)

A. the growing influence of Christianity and the Catholic Church

B. the differing orders of medieval society, the development of feudalism, and the development of private property as a distinguishing feature of western civilization

C. the initial emergence of a modern economy, including the growth of banking, technological and agricultural improvements, commerce, towns, and a merchant class

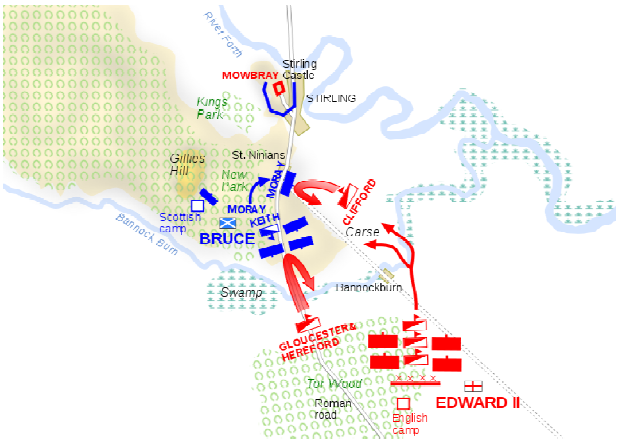
D. the economic and social effects of the spread of the Black Death or Bubonic Plague

E. the growth and development of the English and French nations

- http://www.doe.mass.edu/frameworks/hss/final.pdf
- Higgins Armory Listed in Appendix E (page 108)

Important Battles

Battle at Bannockburn (1314)



- England - King Edward II:
  - 12,000 infantry (half archers)
  - 2,000 cavalry.
- Scotland - King Robert Bruce:
  - 10,000 infantry (far fewer archers than the English)
  - 300 light cavalry
- Result:
  - Scottish victory
  - English army size caused difficulties in coordination on the unfamiliar terrain

- English casualties: 2/3 of their original army
- Scottish Casualties: 2 knights, relatively light (no exact figure)

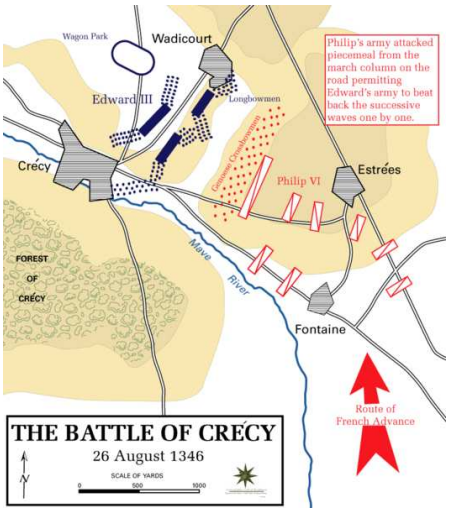
- Important Facts:
  - One of the first notable demonstrations of coordinated infantry being used to defeat a superior force of cavalry, a victory by dismounted commoners over armored knights
  - The Scots were able to trap the English with their wall of spears into a confined space by the Bannockburn waters. Because of the confined space and its size, the English army was unable to assume their battle formations. The disorderly mass was slaughtered by the Scots.

Battle of Morgarten (1315)

- Swiss Confederation - Werner Stauffacher:
  - 1,500 halberdiers and archers
- Austrian soldiers of the Holy Roman Empire - Duke Leopold I:
  - 5,000 infantry
  - 2,500 cavalry
- Result:
  - The Swiss set up an ambush resulting in a crushing defeat for the Austrians.
  - Swiss Victory
- Important Facts:
  - Helped to spread the reputation of the Swiss infantry as fierce fighters that didn't follow the customs of battles between knights, instead barbarically butchering their defeated enemies
  - One of the first battles in which the halberd was used, to great effect; marked the halberd as one of the most powerful weapons at that time

The Battle of Crecy (1346)

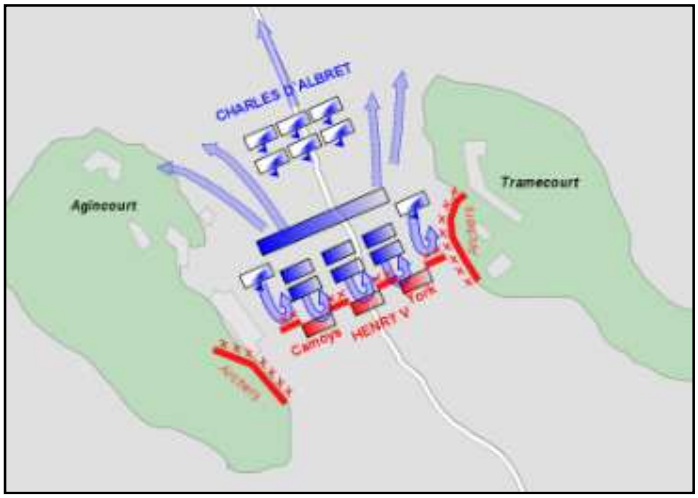
- England – Edward III, Edward (the Black Prince)
  - 4,000 knights/men-at-arms
  - 7,000 longbowmen
  - 5,000 spearmen



- 5 cannons
- France – Philip VI
  - 6,000 crossbowmen
  - 20,000-30,000 knights/men-at-arms
- Result:
  - Decisive English victory
  - A few hundred English casualties
  - 10,000-15,000 French casualties, including 11 princes and 1,200 knights
- Important Facts:
  - Proved the effectiveness of the English longbow
  - First real use of the cannon on the European battlefield
  - Seen by many historians as beginning of the end of classic chivalry: knights were being killed by peasants and anonymous arrow shots, rather than face to face battles against their peers

Battle of Agincourt (1415)

- English – King Henry V
  - Approximately 6,000 soldiers
  - Approximately 5/6 were longbow archers
  - 1/6 were dismounted knights and men-at-arms in heavy armor
- French – Constable Charles d'Albret
  - Approximately 20,000 to 30,000 soldiers
  - Approximately 10,000 knights and men-at-arms (approximately 1,400 were mounted)



- Result
  - Decisive English victory
  - Less than 450 English casualties
  - 4,000 to 10,000 French casualties, including the constable, 3 dukes, 5 counts and 90 barons

    - 700 to 2,200 French prisoners, almost all were nobles as the less valuable prisoners were slaughtered
- Important Facts
    - Victory of the commoners in the English army over the supposedly superior French noble men-at-arms
    - Despite going up against a much larger, better equipped and fresher French army, the English successfully used the bottleneck of the terrain to take away the French's size advantage

The Battle of Arbedo (1422)

- Swiss:
    - 2500 Infantry (Almost exclusively Halberdiers)
- Duchy of Milan:
    - 1600 Cavalry and Crossbowmen
- Results:
    - Swiss are defeated
- Important Facts:
    - The Swiss have initial success against the Cavalry because of their Halberds
    - The Milanese dismounted and used the fact that their lances outreached the Swiss Halberds to outmaneuver the Swiss and to cover the Milanese crossbowmen, effectively defeating the Swiss.
    - This Battle demonstrated that Archers, Cavalry and Pikes were not always a strictly rock paper scissors scenario. Often, combinations such as this could be used to completely out-class an enemy force.

Famous People

- Christopher Columbus (1451 – 1506)
    - Credited with discovery of "New World" in 1492
- Dante (1265 -1321)
    - Italian poet, author of *Divine Comedy*
- Ferdinand and Isabella
    - Isabella (1452 – 1504), Queen of Castile and Leon

    - Ferdinand (1452 – 1516), King of Aragon, Sicily, Naples, and several other places
    - Unified kingdom of Spain and sponsored Columbus's voyage
- Galileo (1564 – 1642)
    - Italian Astronomer and Physicist
    - Made improvements to and discoveries with the telescope
- Joan of Arc (1412-1431)
    - Iconic leader of French Army during Hundred Years War
    - Ultimately captured by English, burned at the stake
- John Smith (1580 – 1631)
    - English Author, Soldier and Explorer
    - Rescued by Pocahontas during an encounter with Native Americans
- King Charles I (1600 – 1649)
    - Namesake of Charles River
    - King of England, Scotland and Ireland
- Leonardo da Vinci (1542 – 1519)
    - Italian Architect, Painter, Engineer, and Inventor
- Martin Luther (1483 – 1546)
    - Holy Roman Empire (Germany)
    - Founder of Protestantism
- Nicolaus Copernicus (1473 – 1543)
    - Polish, developed concept of Heliocentric Solar System
- Pocahontas (1595 – 1617)
    - Native Virginian, allegedly saved John Smith
- William Shakespeare (1564 – 1616)
    - English playwright
    - Produced works such as *Romeo & Juliet* and *Hamlet*

Timeline

Non-military Timeline	***Military Timeline***
• 853 – The Swiss canton of Uri is given the freedom to rule itself. • 1240 – The Swiss canton of Schwyz is	• 1233: King James I of Aragon attacks Valencia with army of mostly men

given the same freedoms as Uri by Emperor Frederick II of the Holy Roman Empire

- 1310 – Dante's *Divine Comedy*

- 1347-1350 – The Bubonic Plague (Black Plague) killed almost 1/3 of the population
- 1381 – English Peasants' Revolt
- 1400 – Beginning of the Italian Renaissance
- 1429-1431 – Appearance of Joan of Arc
- 1450 – Printing Press
- 1452 – Leonardo da Vinci born
- 1469 - Marriage of Ferdinand and Isabella

owing feudal service (not regular army); four years after the finish of the sixth crusade

- 1262 – Rudolf I of Habsburg defeats the Swiss with men armed with Danish broad axes. It is theorized that the Swiss created the halberds off this weapon.

- 1314 – Battle of Bannockburn
- 1315 – Battle of Morgarten
- 1327: King Edward III England marches on Scotland with a large army of largely conscripted soldiers; three years after the first real handgun was invented in Florence.
- 1337-1453 – Hundred Year's War started
- 1346 – Battle of Crecy
- 1386 – Battle of Sempach
- 1415 – Battle of Agincourt
- 1422 – Battle of Arbedo - After this defeat, the Swiss begin shifting their primary weapons from halberds to pikes.
- 1475: The Swiss pikemen have reached the height of their prestige in Europe

• 1492 – Discovery of the New World - Commissioned by the King of Spain, Columbus set on his famous voyage to find a passage to India, but instead found the Americas, where he claimed it in the name of Spain • 1503-1505/1507 - Leonardo da Vinci paints Mona Lisa • 1520 – Protestant Reformation begun by Martin Luther • 1564 – William Shakespeare baptized • 1543 – Copernicus publishes essays stating that the solar system is Heliocentric • c. 1595 – Shakespeare's A *Midsummer Night's Dream* written • c. 1599 – Shakespeare's *Julius Caesar* written • 1609 – Galileo constructs first telescope • 1611 – Shakespeare's *The Tempest* written • 1630s – Puritans begin settlement in Massachusetts	• 1600's – National armies begin to grow precipitously • 1607: Jacob DeGheyn finishes and publishes "The Renaissance Drill Book" detailing how one should drill using a pike or musket; Jamestown Virginia is settled.

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Pre-visit activities

To Do

Post-visit materials

"Did you know" facts

- The crossbow was used as far back as ancient BC China; the Romans also used it.

- The Combat Master Di Grassi considered the halberd to be an effective weapon to break up pike formations.
- Mail armor was on average composed of between 35,000-40,000 tiny metal rings
- By the 1500s the halberd had entered the realm of ceremony; nobility throughout Europe equipted their newly formed personal guards with ornate halberds.
- Up through the American Revolution and even the American Civil War halberds were used in Europe and the Americas and became a symbol of sergeants and other officers of similar rank.
- Pikes could be found used as late as the American Civil War by the South, as they were cheap to produce and reliable.
    - http://www.civilwar.si.edu/weapons_pike.html
- The halberd allowed the common folk (especially in Switzerland) to stand up against trained knights and directly contributed to the downfall of the feudal system and the knights replacement by the professional soldier. Knights trained from when they were young boys until they were around 21; footsoldiers in this time period often had little more training than a monthly drill. For comparison, soldiers today are brought to a battle ready state in about six months from the day they are recruited.
- The halberd was known to be "capable of splitting a man's head from pate to jaw in one blow, even through armor."
    - Anglo, Sidney (2000). The martial arts of Renaissance Europe. New Haven, CT: Yale University Press.
- The pike was used as a weapon for infantry up to the 1700s, both in Europe and the American Colonies.
- Pikes ranged in length from 15 to 24 feet.
- Short pikes, called "Boarding Pikes" were used in combat on vessels up through the late 1800s to keep the boarding enemy at bay.
    - http://en.wikipedia.org/wiki/Boarding_(attack)

Bibliography of additional information

- Anglo, S. (2000). *The martial arts of Renaissance Europe*. New Haven, CT: Yale University Press.
    - This source references the pike here and there but at the 160 page mark it starts to speak more in depth about pikes, from a perspective that of di Grassi.
- Bradbury, Jim (1985). *The Medieval Archer.* The Boydell Press.

    - Book describing aspects of the archer during the Medieval period. Gives detailed accounts of how different bows were made and how they were used by various soldiers on the battlefield
- Hall, Bert S. (1997). *Weapons and warfare in renaissance europe: Gunpowder, technology and tactics*. Johns Hopkins University Press.
    - A look at the modernization of warfare from the middle ages through the renaissance, with particular emphasis on gunpowder and how it was gradual integrated and dominated the battlefield.
- Keegan, John. (1976). *The Face of Battle.* New York: Viking Press.
    - Study of military history from the perspective of the individuals in the direct line of duty, without the stylized format of battle descriptions.
- McNeill, William Hardy. (1982). *The Pursuit of Power.* University of Chicago Press.
    - Comprehensive, covers over 1000 years of military history. Consistently explains the cause and effect of changes to the drill practices, culture and style of soldiers.
- Meyer, J (translated by Forgeng, J. L.) (2006). *The art of combat: a german martial arts treatise of 1570*.New York: Palgrave Macmillan.
    - Meyer's manual includes a chapter on polearms.
- Prestwich, Michael. (1996). *Armies and Warfare in the Middle Ages: the English Experience.* New Haven: Yale University Press.
    - Examines the development of Medieval warfare, focusing on the English armies. Analyses the ways soldiers were recruited, commanded and supplied, as well as the way armies fought together.
- Trim, D. J. B. (2003). *The Chivalric Ethos and the Development of Military Professionalism.* Boston: Brill. Ebook: http://site.ebrary.com/lib/wpi/Doc?id=10089093
    - Examination of the relationship between the decline of chivalry and the rise of military professionalism in late Medieval and Renaissance Europe. Wagner, Eduard (1979).

Connections to Museum

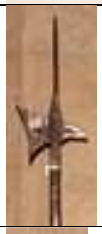
Crossbow

Currently located on ground floor in display case outside the auditorium.

2006.01 - From around 1475 - 7lbs, 14oz - Ornately decorated to resemble snakeskin - Very rare example of the crossbowman's weaponry at the time	

Halberds

Typically can be found mounted to the columns in the Great Hall along the Eastern Wing (Refer to highlighted area on map)

68 **Origin:** Southern Germany **Date:** 1500 - 1550	
507 **Region:** Italy **Date:** Around 1540	
662 **Origin:** Germany **Date:** 1525-50	
1265 **Region:** Germany **Date:** 1500-1550	
1274 **Region:** Italy **Date:** End of 1500s	

1998.03 **Region:** Germany, perhaps Thuringia **Date:** 1600-10	
2501 **Region:** Massachusetts **Date:** 1678	
2546.6 **Region:** Italy **Date:** End of 1500s	
2929.1 **Region:** Germany or Switzerland **Date:** 1500 - 50	
2929.2 (Currently Not on Display) **Region:** Germany or perhaps Switzerland **Date:** 1500 - 1525	

Pikes

Currently mounted on column in Western Wing of Great Hall, between bays WA12 and WA10 (Refer to highlighted area on map)

238.65 (Currently Not On Display) **Region:** Central Europe **Date:** 1400 - 1500	
283 **Region:** Austria **Date:** 1600s	

287 **Region:** Austria **Date** 1600s	
482 **Region:** Germany or Austria **Date:** 1600s	

Armor

442 **Origin:** Germany or Austria **Type:** Cabasset **Date:** 1600 - 1650	
887 **Origin:** Perhaps Switzerland **Type:** Burgonet **Date:** 1550 - 1600	
1125 **Origin:** Northern Germany **Type:** Half Field Armor **Date:** 1550 - 1600	
1966 **Origin:** Possibly England **Type:** Skull Cap **Date:** 1600s	
1998.01 **Origin:** Germany (Nuremburg) **Type:** Comb Morion for Royal Guard **Date:** 1590	

2203 **Region:** Possibly Italy **Type:** Back of Brigandine **Date:** Early 1500s	
2540 **Region:** Probably Spain (Aragon) **Type:** Sallet **Date:** 1450 - 1500	

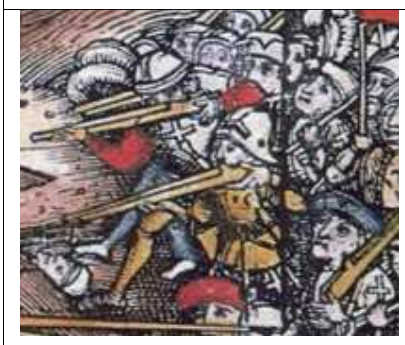
Primary sources

- Basel woodcut “Dorneck 1499

This image shows the armies of Emperor Maximillian I of the Holy Roman Empire being beaten by the armies of the Old Swiss Confederacy near the village of Dornach, ending the Swabian War between the Swiss Confederacy and the Empire, granting Switzerland independence from the Empire. The image shows both pikemen and halberdiers in combat, and shows standard arms and armor for infantry of the time.

Portions of Image, with Significance

	A halberd being used as an axe – to chop.

	The Halberd's spike in use
	Pike men in armor, notice how they have plate mail on their upper body, but their heads have only hats and their legs completely defenseless. Notice also how they form a wall to defend against the mounted knights.
	At this point in time firearms were being used in combat, but it was more for shock than actual damage, do to their reliability and aiming issues.

[Possible Expansion: Include here a textual primary source. Possible Choices:

An excellent place to start would be Philip de Commynes "Memoires", he was a participant in two major battles, Montleherey in 1465 as a young man, and Fornovo in 1495 as an old one, and in his Memoires he describes both battles in some detail. Fortunately, his Memoires have been translated several times into English, if you do not read French. They should also be easy to acquire. Jean de Haynin describes several campaigns in his Memoires,

in the 1460's and 1470's, his memoires are hard to get a hold of, and have never been translated out of French. The Library of Congress has a copy.

Jean de Bueil wrote a semi-autobiographical story, 'le Jouvencel', which describes quite a bit about medieval combat. Unfortunately, there is no English translation again, although an older edition was re-printed in 1996. There will be a new edition coming out, but it hasn't been released as of yet. Here is a link to news regarding that, with a snippet of a translation http://oregonstate.edu/dept/humanities/Newsletter/Spring%2005/Szkilnik.htm

De Bueil was a French captain contemporary to Joan of Arc.]

Post-visit activities

To Do

Appendix 2: IQP Proposal

Virtual Armory

2009 – 2010

IQP Proposal

Amanda Conner, Jotham Kildea, Huan Lai

Kevin McManus, Matthew Sonntag

Mission Statement:

To develop an interactive and instructional demonstration and will focus on the Medieval Foot soldier. The demonstration can be taught to the Higgins armory teaching staff, who will in turn perform it for the general public. This demonstration will involve various forms of media, and will focus largely on how the Foot Soldier fought in the medieval period.

Old version #2:

To develop some interactive demonstration that will increase the appreciation and understanding of The Higgins Armory by the general public. We plan to do this by utilizing various combat manuals from the time period and various forms of media.

Old version #1:

To develop some interactive media that will increase the appreciation and understanding of The Higgins Armory by the general public.

Virtual Armory Ideas

Timelines

- **Mouse over timeline**
- **Evolution of Weapons & Armor from Conception to Modern Day**
  Timeline of changes and upgrades in armor, both stylistic and functional.
- **Parallel Evolution of Arms and Armor in Cultures around World**
  Comparison of different armor styles in major regions of world, as defined by needs of culture and geographical requirements.
- **Evolution of Armor Making Over Time**
  A Discussion of how the technology of armorsmithing has changed and improved over time.

Online/Computer

- **Online database**
- **Interactive flash about arms and armor shapes**
- **Integrate a Forum component?**
- **Alternate Reality Game**
- **Virtual castle**
- **Interactive interview with a knight (and others?)**
- **Virtual exhibition**
- **Better front end for bibliography in excel**

- **Virtual "Google Street View" Tours**

  Panoramic tour of entire armory with each item in armory tagged and linked to information in database

- **Classic Side-View "Fighting Game" incorporating Combat Manual**

  Players each take control of a knight and fight against each other. The knights use techniques presented in Combat Manual, and show the weaknesses and strengths of each move, ie what technique is effective or ineffective against, and how the moves look in combat.

- **Wii Combat Game**

  With a wii-remote embedded in a replica weapon, teach users the combat tecniques by having them actually do them out, as per the techniques in the Combat Manual. Potential for expansion: first-person fighting game where player uses sword to fight off enemies

Miscellaneous

- **Audio clips about regions explaining the different arms and armor**
- **Behind the scenes look at the museum**
- **Matching game => which item belongs to which region**
- **Explore a suit of armor**
- **“Equip yourself for various situations” game**
- **How to Use Combat Techniques**

  Training Session with instructors and students using replica tools as per the techniques in the Combat Manual

- **Effectiveness of Armor, and Different Types against Different Weapons**

  Have people wear small portions of different types of armor to give hands-on demonstration of how different types of armor had different uses depending on the weapons

- **Medieval Siege and War Strategies Training**

  Students are put into groups and are taught different medieval battle strategies, and are "set upon" each other to demonstrate strengths and weaknesses of each strategy.

- **How to Make Armor with Modern Tools**

  Similar to modern cooking shows, this would be a step-by-step practical guide to forging armor in the modern day.

- **Armory Atlas**

Map of World with tags showing where and when artifacts were made as well as when they were found and added to collection. Could be linked to database for further information.

- **Practical Guide to Larping**

  Larping is essentially fake sword (foam and rubber) fighting combined with role-playing. This would bring the techniques presented in the Combat Manual and apply them to larping in a desperate attempt to bring some credibility to the pastime.

Matthew Sonntag — The Common Foot Soldier

Research Schedule:

1) Weapons used by the Foot Soldier
2) Armor used by the Foot Soldier
3) Techniques common to the Foot Soldier and his training
4) The Status of the Foot Soldier in Society, and his lifestyle

Huan Lai — Military Context 1300–1500

Research Schedule:

Week 1: The evolution of military organization and the rise of military professionalism

Week 2: Technological development and its effects on warfare

Week 3: Medieval military strategies and tactics

Week 4: Economic and political implications of warfare in Medieval Europe

Jotham Kildea — Military Context 1500–1650

Plan of work:

Week 1: The evolution of military organization and the growth and refinement of military professionalism

Week 2: Technological development and its effects on warfare

Week 3: Renaissance military strategies and tactics

Week 4: Economic and political implications of warfare in early modern Europe

Kevin McManus — Halberd and Quarterstaff

Research Schedule:

Week 1: Quarterstaff as Tool; It's History and Significance

Week 2: Quarterstaff as Weapon; Techniques and Styles

Week 3: Halberd as Tool; It's History and Significance

Week 4: Halberd as Weapon; Techniques and Styles

Amanda Connor — Pike

Weekly Planner:

Week 1) Origin of the Pike

Week 2) Forms of the Pike

Week 3) Integration into combat with:

1. Other soldiers
2. Formations
3. Other weapons

Week 4) Techniques in Drill and Combat

A Term Work Schedule

Week 1: reorganization and reorientation to subject matter
brainstorm ideas for product

Week 2: Discussion of individual research refinement of product ideas based on results of weekly research
Narrow list of ideas to a few to choose from

Week 3: Discussion of individual research refinement of product ideas based on results of weekly research
Agree upon final product and then decide who will focus on what

Week 4: Discussion of individual research refinement of product ideas based on results of weekly research
Generate list of necessary assets/deliverables and major tasks for each area of responsibility

Week 5: Discussion of individual research refinement of product ideas based on results of weekly research
Draft work plan and iterate assets/deliverables list

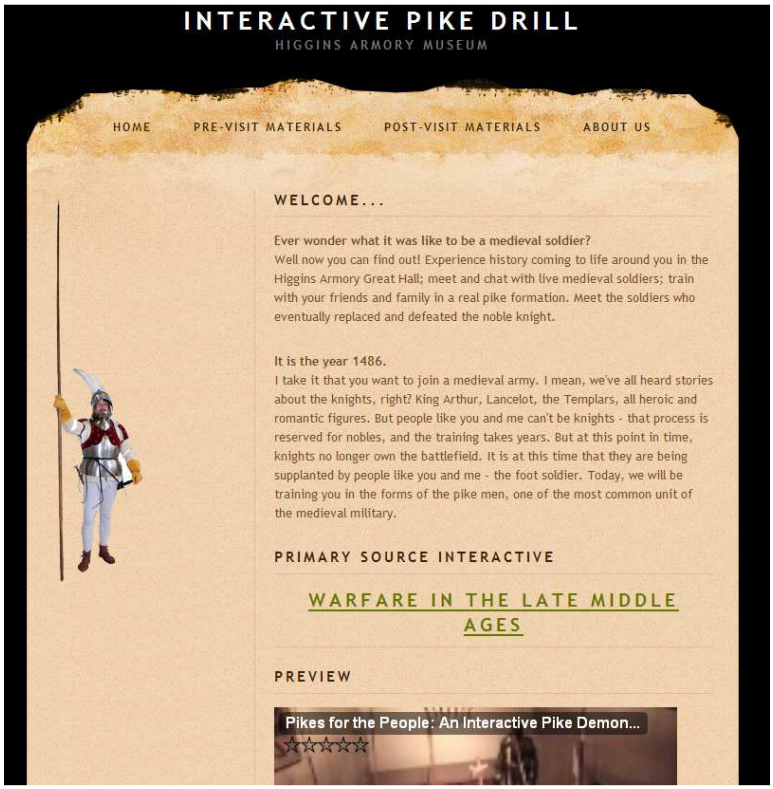
Week 6: Final decision of deliverables for project
Finalize work responsibilities for all members

Week 7: Finalization of work schedule for B term
Update project proposal to reflect decisions in A term

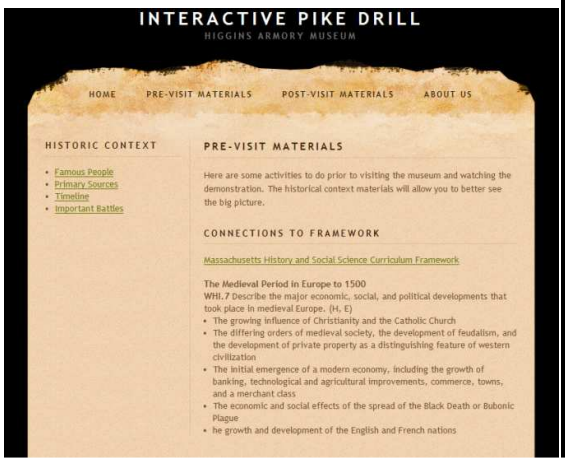
Appendix 3: Website

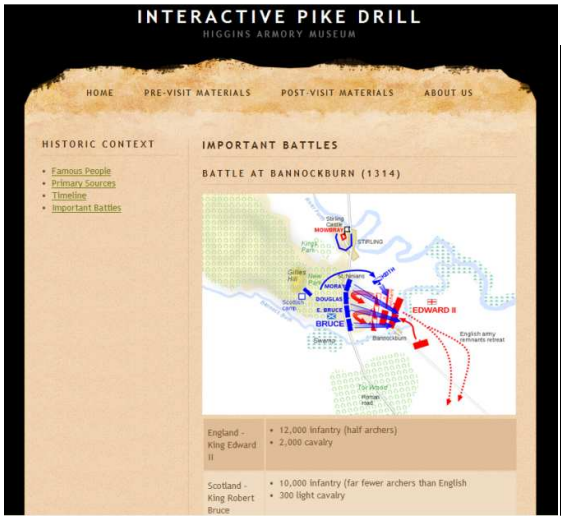
Introduction

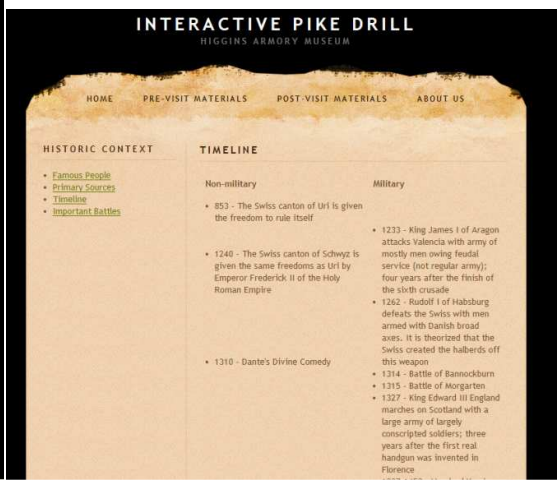
A website for the presentation was developed, primarily as a means to present pre-visit and post-visit materials to the public, but also as a form of advertisement for the presentation and the Higgins Armory Museum. For the most part, the information on the website is reproduced from Appendix 1: Staff Handbook. The website also serves the function of explaining the purpose and context of the demonstration and gives credit to the Higgins Armory, WPI and the IQP team.



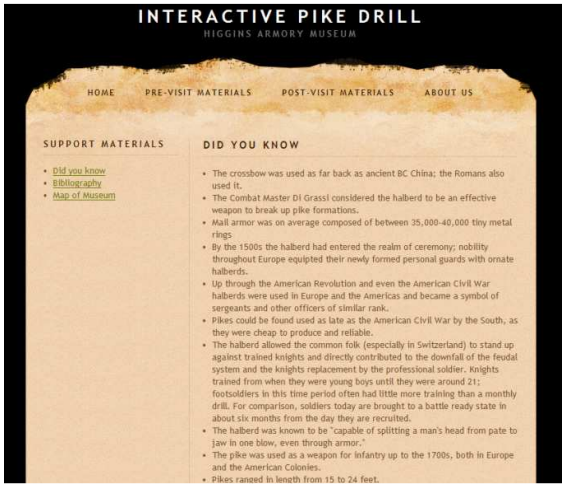
Pre-Visit Materials

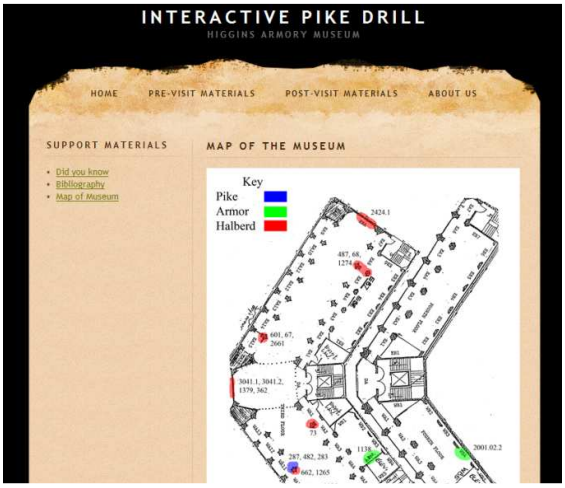






Post-Visit Materials





Appendix 4: Interactive

The interactive was developed as a way to present primary sources to the visitor while providing them with more detailed information about the artifact in seemless and interactive way. In addition to developing the interactive as seen on the website, the framework was developed so that the Higgins Armory staff could easly create new interactive like it using other primary source artifacts with very little technological knowledge required.