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Arms and Armor of the Medieval Knight

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Arms and Armor of the Medieval Knight

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by

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Abstract

The medieval knight was the deciding force on the battlefield during the Middle Ages, due primarily to his specialized arms and armor and his extensive training. This project tells the story of the knight through the arms and armor at his disposal. The team's substantial research document on the knight's historical context, weapons, armor, and equestrian equipment formed the basis of a 15-minute video documentary that will be shown hourly to the public at the Higgins Armory Museum.

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Introduction

Some of the most captivating historical artifacts are the arms and armor of the medieval knight. Perhaps no other historical artifact is as recognizable as the knight's plate armor or sword. This intermediate qualifying project is devoted to researching these items and creating a documentary which will be displayed in the Higgins Armory Museum. The video-documentary highlights and unites the historical context, armor, arms and equestrianism of the medieval knight into a palatable form.

The majority of this project was devoted to the documentary - a fifteen minute film which will be shown in the Higgins Armory Museum's AV room, in a cycle with other video-documentaries. The film combines stills of Higgins artifacts, historical paintings, and illustrations from medieval manuscripts with footage of modern re-enactors, interviews with experts, and Jonathan E.H. Hayden's professional narration. The video seeks to show the audience how the armor and weapons were used and equipped, while answering questions that are frequently posed to the Higgins Armory Staff. Above all, the documentary answers one question: who was the knight?

The knight was defined by his training and equipment. He was a martial artist, an equestrian, and a powerful societal figure. A knight mastered horsemanship, social skills and martial arts. He learned how to fight on foot, on horseback and with many different weapons, all while wearing a heavy and expensive suit of armor. He was the medieval equivalent of the modern tank, expertly breaking up enemy infantry on his warhorse.

A Knight's horses had to be of a certain quality. His horse needed to be strong enough to carry an armed and armored man at a gallop, sturdy enough to bear wounds, and brave enough not to flee from the noise of battle. The knight's warhorse was an exceptional animal, and the demand for them was so great that the business of horse breeding and training became a major industry in the Middle Ages.

Since knights spent so much time on horseback, specialized horse equipment was necessary. A knight's saddle was steeply banked, with a high pommel and cantle. This formed a cradle which provided the knight with stability; it allowed him to keep his hands free and to take blows while mounted.

The lance was a specialized weapon that the knight used on horseback. It was derived from the roman javelin, changing over the centuries into a long spear with a narrow tip. It was held under the arm in a couched position, which allowed the vamplate, the grapper and the lance rest to distribute the force of impact across the knight's armor.

While the lance was a powerful weapon, the sword was much more versatile. It was a weapon that was useful on foot and on horseback, against unarmored or heavily armored opponents. The knight's longsword could be held with one or two hands on the hilt to slash, or held at the half-sword for thrusting. It could even be turned around and swung as a hammer.

While the sword was important, a knight's training also involved grappling and dagger play. Modern knowledge of medieval wrestling techniques comes from fechtbuchs. These medieval fighting manuals served as guides or studying aides. These often overlooked aspects of knightly combat may be the most dangerous, as they seek to exploit the weaknesses of the knight's armor. The dagger, with its thin blade and sharp point, was a perfect weapon to pierce between joints in the armor.

The armor of the knight represented a significant investment. Each suit of armor was made specifically for the knight who would wear it. The extra weight of the armor was distributed across the body, and did not restrict the knight's movement. Wearing armor, the knight was expected to mount and dismount the horse without aid.

In the early middle ages, the best protection a knight could acquire was mail. This armor was comprised of tens of thousands of interlocking iron rings. It provided excellent defense against slashing weapons, but little defense against crushing attacks. As early as the 1200s, plates of iron were added to the mail coats. This transitioned to full plate armor by the end of the 1300s.

In the 1500s the use of plate armor went into a major decline. Firearms became the knight's worst enemy. Armor which could effectively stop increasingly powerful gunpowder weapons became prohibitively heavy.

This group researched the arms, armor, equestrianism, and social context of the medieval knight. These four categories also represent the division of research labor. The gathered research was used to create the aforementioned video documentary.

Eric Clayton researched medieval arms, dividing his research into blunt weapons and polearms, swords, grappling and dagger, and medieval ranged weapons. Some of the weapons that he studied are

knightly weapons like the bec-de-corbin and longsword. Other weapons were used against the knight, like the longbow or arquebus.

Erik DeVolder researched horses and medieval equestrianism. He focused mainly on horse equipment, medieval horse varieties like the palfrey, destrier, rouncey and courser. His research also included the lance, both as a tournament weapon and a battlefield weapon.

Justin Fyles researched the historical and political context of the knight. His research revolved around chivalry, feudalism, a knight's upbringing, and the historical evolution of the knight. He covered topics like the dubbing of a knight, his training, and manorialism.

Jonathan E. H. Hayden researched knightly armor. His research was split into 4 categories: Armor manufacturing, armor before 1400, armor after 1400, and the process of donning armor. His research covered regional differences in suits of armor, the evolution of specific pieces of armor, and the many techniques and trademarks of armor manufacturers.

The importance of arms and armor is not limited to the Middle Ages. Today, some soldiers are equipped with body armor, and most soldiers have helmets. Dagger-like bayonets have been in use for over a century, for close quarters combat. This intermediate qualifying project shows the historical precedent for these items, as the knight was the first to combine heavy armor and weapons so effectively.

History and Context of the Middle Ages

Ruling Structure

The Middle Ages was a time of loyalty – not necessarily to a country, but rather to whomever happened to be above someone on the social ladder. This was characteristic of a political system we now refer to as *feudalism*, which developed in the half-millennium after the fall of the Roman Empire (in 476 CE[1]) left a distinct lack of order.[2] To properly understand the knight and his context in society, it is imperative that one first grasps the shape of feudal society in the Middle Ages.

Feudalism and Manorialism: a Modern Perspective

While feudalism was the political system (or rather the set of customs that medieval political systems seemed to follow) in medieval Europe, manorialism was the economic system. To fully understand the concept of manorialism, one must first grasp that until the late Middle Ages, towns and cities didn't really exist as they do today, or even as they did in the Roman Empire. In both instances, towns and cities are/were connected through an infrastructure of trade, travel, and communication. But in the Middle Ages, lords managed villages, which were primarily self-sustaining. The lord was granted this by a lord higher in power.

In today's modern society we tend to think of economic systems as being either socialist or capitalist. If a little more thought is put into it, we might even be able to define varying degree of points in between the two. Yet between them, manorialism is really a "none of the above" selection.

Capitalism is an economic system characterized by private or corporate ownership of goods. This means that either the people living in the capitalist society, or corporations owned by people living in the capitalist society, own the land, buildings, and other entities in that society. Capitalism is often associated with a free democratic or republic society in which the citizens have a say in the way they are governed.

[1] (Painter, 1953, v)
[2] (Singman, 1999, 4)

Manorialism differs greatly from this economic structure in many ways. In a feudal society, in lieu of personal ownership, a lord, often a king, owns all the land.[3] That land is then granted to those in a class below that lord, and they would compensate with their service or allegiance. Those in the class below the lord then grant use of the land to those in a class below them. This cycle continues until the bottom rung of the ladder is reached. "No land without a lord,"[4] the law of the land at the time, effectively summed up this manorial system.

Feudalism differs from capitalism's accompanying democracy or republic in that feudalism is a one-way ladder. This is to say that power and entities are passed down through the chain, but an unequal say in the government is passed back up. A true democratic or republic governing body protects the individual rights of its citizens in return for support; in the end, the citizens have a say in who gets elected into office, and what liberties they strip from the people. Feudalism on the other hand puts a lord in charge that exerts rule based on hundreds of years of custom on those below him.

Likewise, manorialism draws few similarities to today's defined socialism. In a true socialist society, the people, often guided by a totalitarian government, work for the good of the community. Yet in a feudal society, each tier on the social pyramid works in its own self interest. A person in a class below the lord will do as the lord pleases to reap the full benefits of his generosity, and at the same time, he or she will fully extort those in the class below them to gain as much as he or she can, both in the power struggle and the race for the riches. This brings up another characteristic of socialism that does not fit into the context of feudalism: the class structure is effectively abolished. This is entirely contrary to a feudal system where the class structure is markedly defined and tiered.

One could, however, begin to compare a state of feudalism and manorialism to a country controlled by warlords, such as Afghanistan. There, several warlords each control a specific area of land, and are responsible for protecting the people within it. In turn, the people are required to give up whatever is asked of them by the warlords; the people have a pledged allegiance to the warlord in control of their area. In a feudal society, those below lords give back in the form of either a military or labor tenure. Feudalism was centered on the need for military power.[5] But this analogy begins to fall short in that the actual governing body of Afghanistan is independent of the warlords, and is, in comparison, powerless.

[3] (Singman, 1999, 6)
[4] (Painter, 1953, 106)
[5] (Painter, 1953, 104-107)

In a true feudal society, power would reside first with the lord or king. He would then trickle that power, along with protection, down as he saw fit through lessers in turn for allegiance and service.[6] In this sense, the power was owned by the government, yet displayed in varying degrees by classes down the social ladder.

Context of Feudalism in Medieval Society

Though the feudal system varied subtly by usage during the Middle Ages in Western Europe, there were some fundamental features that remained the same. The basic medieval feudal structure featured a very pyramidal shape. At the top was a lord, and at the bottom was a commoner, and as such, the structure was certainly bottom-heavy. But medieval feudal society had the interesting characteristic of having two distinct divisions: aristocrats and commoners.[7] The distinction was that, with the exception of those in the bottom rung of the aristocracy (originally the knight), aristocrats owned the land.

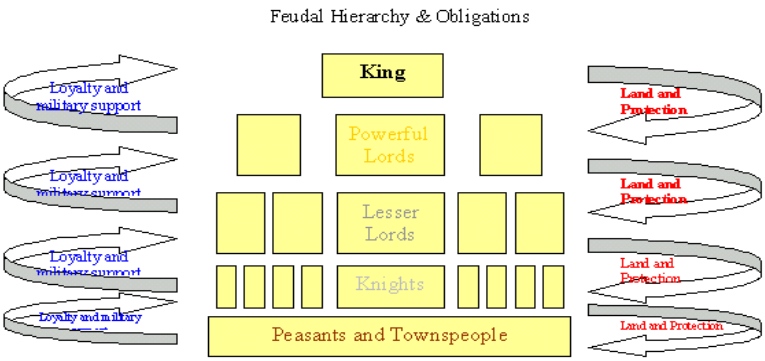

Figure 1: Example of a European feudal hierarchy. (Babbie, 2003)

Most interestingly, feudalism did not consist solely of this pyramid; it also refers to the implied contracts between each entity in the long, hierarchical relationship. This is to say that although a basic feudal and manorial structure began to develop as early as 800 AD in places such as France, it did not constitute a fully feudal society. In the case of the first incarnations of feudalism in Western Europe, for example, the lords certainly exerted a power over those below them. This relationship could be compared to that of a slave owner to slave relationship. Although the vassal got paid for his services, he still had to bend to every will of the lord, and the lord was entitled to essentially anything held by the vassal. If the vassal was a knight, he had to fight at the lord's command.[8]

This lord-vassal affiliation changed drastically as the feudal system began to mature. The vassals' relationships to their lords became more indicative of today's voluntary contracts. It was a lot like taking a job. Sure there was much more to the status than filling out an application, but both the

[6] (Painter, 1953, 112)
[7] (Singman, 1999, 6)
[8] (Painter, 1953, 118)

vassal and lord benefited from their respective sides of the contract, and were protected from each other. Furthermore, the lord (the boss in this relationship) could revoke his share of the contract (and any goods associated with it) only if the vassal violated his obligations in the relationship.

Since the lord was no longer as entitled to the holdings of the vassal, a very interesting characteristic began to form: an aristocratic position became one that was inherited. This development happened most likely for two other major reasons. The first was that since feudal society associated wealth and power, the son of a vassal would be foolhardy not to try to attain his father's holdings. On the other side, the parents had a hardened tendency to want to leave their riches to their offspring. Heritability became a core structure of this society very quickly, and was key to its stability.

History of the Knight

When one thinks of a knight from the European Middle Ages, the image of a gallant English figure in full plate armor on horseback often comes to mind. The concept of the knight as a social class is not often included in this vision. In truth, the knight was more of a concept, inadvertently adopted by many feudal European cultures over a long time period that blended a hardened, vicious warrior with a rich, aristocratic man.

The Pre-History of the Mounted Soldier

The concept of a mounted soldier is relatively old. When the Roman Empire was just a baby in the first millennium BC, other cultures such as the Greeks and the Medes, which was centralized in modern Iran, were mounting armored men on what were then unusually large horses that they bred for the occasion. The mounted warrior also made a brief appearance in the height of the Roman Empire. To say that these armored riders lead directly to the development of the knight would be relatively difficult to back up however; not until the Germanic tribes began to rule Europe during the first millennium CE did warriors actually ride to gain an offensive advantage. But even then, the horseman's advantage was mainly in agility and stamina. It was not until paired stirrups literally invaded from Asia in the 800s CE[9] that a true mounted warrior was developed in Europe; one could certainly argue that the knight, as a mounted warrior, originated in Asia.

Figure 2 : A reenactor displaying typical Roman cavalry. (Invalid source specified)

The History of the Knight as a Social Class

There is much more to the knight than simply being a mounted soldier. By 1000 CE the knight as a mounted warrior was quite well established on the European battlefield. One could even say that knights were the trumping force in the early medieval military. The value of the knight was certainly not overlooked by those higher in social position. But this mounted warrior of these days was merely a predecessor to the true knight.

As the value of the knight was realized, a very curious thing began to happen: the knight, a mounted warrior, generally associated with the rest of the soldiers as commoners, began to move up in

[9] (Keen, 1984, 23)

class. They were in fact being absorbed into the aristocratic side of feudal society, a move which was surely not contested by the knight, who was responsible for the purchase and upkeep of his horses, weapons, and armor. In most cases, a knight would receive land from the aristocrats in turn for his service. This shows a certain contradiction to traditional feudal structure where commoners were not land owners, but rather lived on the land provided by the aristocracy. Indeed the knight was moving up in class, and as a consequence the aristocracy class was becoming the warrior class.

As the warrior class became richer, the knights were able to buy better weapons and armor. The knight could begin to afford to practice fighting full-time, and became more valued by their superiors. Thus, they received more land and pay from their upper aristocrats, causing the knights to get richer, and buy better equipment. This snowball effect catapulted the knight into a very important status, both on and off of the battlefield, and demonstrates how he is not solely a mounted soldier, but rather a homogeneous mixture of both fighting ability and social status.

The Knight in the Early Middle Ages

By the year 900, the basic medieval feudal structure had evolved in Western Europe. The knight was beginning to assimilate into the aristocratic section of society. At this point, the knight was for the most part toward the bottom of the aristocracy pyramid – often times a younger man hired for military service. He might have owned some land and a few peasants, but he was only granted what he and his family needed to sustain themselves; the land was not much a symbol of wealth.

The Knight in the High Middle Ages

The aristocratic hierarchy was long primarily a warrior class. There was a structure of vassals beneath the lord that included barons, counts, and other landowners, but they were often knights as well. Naturally, all knights were fighters before anything else; but it is what they fought for that set the classes of knights apart. Like other warriors, the knights fought for their lord, but they also aimed to gain honor, glory, and the spoils of battle. Knights who owned no land fought for the money they needed to survive. In fact, such knights often made less money than some well-to-do commoners. Knights who did have a small holding, on the other hand, would do anything asked of them by their lord in hopes of receiving a cut of the bounty. The further up the aristocratic ladder, the greater the independence the knight had from his superior.

As previously mentioned, the image of a knight that one typically gets often represents a very short time period in the knight's tenure as a class, if historically accurate at all. The knight's military equipment did not evolve much during this period, but chivalry did.[10] Just as the plate armor often pictured to accompany a knight at all times was not present until the latter years of the Middle Ages, the image one might have of the polite and chivalrous knight did not develop right away. In fact, at the beginning of the High Middle Ages, knights were known for their pomposity. It was not heresy for knights to imbibe large amounts of alcohol[11] (though an alcoholic beverage was a common source of sanitized water). Ironically, since the bounty a knight could receive if he ransomed a knight he captured, wars at this time were rather nonviolent, yet at the same time knights were known for beating their wives for questioning their actions.

Figure 3: Example of a French knight in the 1200s. (Singman, 1999, p. 2)

The Knight in the Late Middle Ages

The Late Middle Ages, approximately 1300 – 1500, brought the development of the firearm. In turn, "these devilish instruments of artillery,"[12] as written in *Amadis de Gaula* (a romance tale of the late middle ages), were infamous for bringing about the end of the era of the knight. But that was not until the end of the middle ages. In reality however, not only were the early firearms horrifically ineffective, the Late Middle Ages was the period in which the chivalrous knight as we know it today truly flourished. But alas, the end of the era drew near.

[10] (Singman, 1999, 120)
[11] (Painter, 1953, 119)
[12] (Montalvo, 1508); (Keen, 1984, 242)

Cultural World

Chivalry

Despite lacking the refinement of modern society, the cultural world in the time of the European knight was quite sophisticated. An unwritten rule of ethics, honor, and courtesy – chivalry – ruled the land. Although chivalry is now often used to refer to the courtesy of men towards women, its social reaches were at one time very vast. Chivalry as a word can be hard to define, but its association with knighthood is unmistakable.

Though the Middle Ages truly began with the Germanic invasions of Rome during the first half-century CE[13], the institution of Chivalry began slow development beginning in the 1100s, and never reached its zenith until close to the end of the era. The institution of chivalry with regards to the knight can be described in three general realms, only the first of which is the aspect of courtesy. This is indeed quite similar to the duties to women and countrymen written about so often in modern literature. The knight was not always known for this sort of character however. In fact, until perhaps as late as the 1300s, knights were seen as rough in character.[14] But as the knight moved up in social class the refined nature that tends to get associated with them began to surface. It is for this for this reason that the 14th century is often referred to as the 'golden age' of chivalry.[15]

The second aspect of chivalry that pertains to the knight is that of religion. Religion was a major source of motivation in the Middle Ages, and the knight was not exempt. The chivalric code helped produce a knight that practiced obedience and fidelity to the church, and practiced Christian ideals outside its walls. Christianity was quite widespread as a state institution by as early as 300, and was a major source of conflict in the Middle Ages. The knight, being a powerful warrior, often fought in these religious battles, and when not fighting, abided by the church's ideals. These ideals of Christianity helped mold the knight into a gentleman of great character by filling in the voids left by a lacking written law of the land. These characteristics were beginning to form as early as the mid-1100s, as signified in the description of a knight in the epic 'Girart', "He is brave and courtly and skillful, and noble and of good lineage and eloquent, handsomely experienced in hunting and falconry; he knows how to play chess and backgammon, gaming and dicing. And his wealth was never denied to any, but each has as

[13] (Painter, 1953, v)
[14] (Painter, 1953, 119-120)
[15] (Prestage, 1928)

much as he wants … And he has never been slow to perform honourable deeds. He dearly loves God and the Trinity."[16]

Lastly, but possibly the most characteristic aspect of chivalry to pertain to the knight, is the institution of war as a lifestyle. In the end, a knight was a warrior by trade. The knight was expected to be loyal to those above him. If his lord called upon him to serve, he was obliged to do so long as it followed feudal and chivalric law. This class system defined feudalism, and in turn, the Middle Ages.

Tournaments

The distinction of war as a lifestyle is very important in conceptualizing the Middle Ages' culture. In today's society, war is more of the counter-culture. That is to say that the general consensus of the people living in modern society look at war and violence as practices that are highly objectionable and that should be avoided at all costs, and the state assumes the sole right to exert violence. In Middle Ages' culture, this was far from the case. War was the glue that held together the entire governing system, and was entrenched so much in culture, that it was practiced even in times of peace in the form of the tournament. Especially in the case of the knight, warfare was quite privatized in Middle-Ages culture.

Some historians would argue that the tournament was primarily a way for the knights to practice their trade in times of peace[17]. The tournament's role as an arena of practice can certainly not be denied. After all, does the practiced knight not hold some sort of advantage over the unpracticed? As a warrior by trade, a knight would be foolhardy not to vest time in becoming the best he can be. Furthermore, the benefits of peace-time training actually contributed to the initial rise of the tournament, beginning in France around 1050.[18]

But the knight had a much broader role in Middle Ages' society than simply being a practiced warrior. He seeked honor, glory, and the spoils of battle. He was a gallant figure; a figure that could be considered nothing short of a role model – an idol. The social class a knight held was nothing to be ashamed of. By the high to late Middle Ages, the knight was toward the top of the aristocracy. What better place for the knight to show off his skill and to be the center of attention than at a tournament.

[16] (Keen, 1984, 42)
[17] (Keen, 1984, 88)
[18] (Keen, 1984, 83-84)

To the members of Middle Ages' society who watched these displays, the tournament was less a mock-war, and more of a theatrical show for their entertainment.

As the institution of the tournament matured, it became much more than a voluntary show of skill and ability. The knight became as obligated to participate in the tournament as he did in a war. Indeed the tournament became so engrained in society by the late Middle Ages that it became part of the knight's obligations when he was dubbed. The transformation of the tournament from war practice to part of feudal society can be seen most greatly when looking at its acceptance by the church. The church initially condemned tournaments in 1130, and eventually prohibited them. The pope at the time, Pope Innocent II, actually orated of the most accurate descriptions of the tournament when he called for the condemnation of "those detestable markets and fairs, vulgarly called tournaments, at which knights are wont to assemble, in order to display their strength and their rash boldness."[19] Yet as their popularity increased, the church was forced to permit tournaments.

Coming into the picture at the end of the Early Middle Ages, the tournament gave the opportunity for the knights to compete on three levels of fighting ability.[20] The melee battle was at the center of the tournament. This form of mock-battle was the most like an actual battle in a time of war. The knights would be divided into two teams, face each other in a line, and charge. A second form of battle featured at the tournament was hand-to-hand combat. In this form, knights would be paired up one-on-one, and fight. This mirrored the battle that would ensue after two knights were knocked from their horses on the battlefield. The last form of battle that was featured at these tournaments was the joust.

Figure 4: Melee battle circa 1300.
(Heinrich von Hefner-Alteneck, 1881**)**

[19] (Keen, 1984, 84)
[20] (Vale, 1981, 67-68)

Figure 5: Knights jousting. (Tapestry Standard, 2003)

The joust was a variety of tournament battle that mimicked the beginning of a battle in war where two knights were mounted and used some sort of pole arm to dismount one another. This mock battle form pitted a mounted knight one-on-one with another. With the help of lances specially designed for the occasion (often hollow wood to enable breaking on impact), the knights charged each other with the intention of dismounting the other. Despite not being the major event of the tournament[21], the joust has been represented through history as characteristic of the Middle Ages. By the 1400s, the joust was mostly for celebration and display, and offered little educational value[22].

Heraldry

Heraldry itself can be as difficult to define as chivalry is. In its purest form, heraldry is simply the marking of one's outerwear to distinguish people or groups. Middle Ages' heraldry evolved in the 1100s[23] out of the need to differentiate friend from foe on a battlefield littered with metal-clad warriors. In the beginning, heraldry consisted of little more than a coat of arms on a soldier's shield, and was neither widespread nor comprised of a set of customary rules.The application of heraldry by the knight became quickly apparent. First, the knight's quest for honor and glory was greatly highlighted by his display of colors. Other warriors on the battlefield could quickly distinguish a particular knight as one to beware. In tournaments, a knight could be quickly identified by the crowd as one of great or poor ability, and often wore colors associated with his lord.[24] There is no source that highlights heraldry's reach in the tournament as well as the quote from Chretien de Troyes, "Do you see that knight yonder with a golden band across his red shield? That is Governauz of Roberdic. And do you see that other one, who has an eagle and a dragon painted side by side on his shield? That is the son of the King of Aragon, who has come to this land in search of glory and renown."[25] By the end of the 1200s, heraldry had evolved into a fairly strict convention, such as the ordinaries in the image to the right.

[21] (Keen, 1984, 86-87)
[22] (Vale, 1981, 70)
[23] (Keen, 1984, 125)
[24] (Vale, 1981, 84)
[25] (Keen, 1984, 127-128)

But the battlefield (or mock battlefield) was only one small aspect of the reaches of heraldry. As feudalism began to flourish, and the knight progressed toward the top of the aristocracy, the value of holding such a position also increased. Therefore, as aristocratic positions became ones that were inherited, it greatly behooved aristocrats to display their colors. One's coat of arms became his display of status.

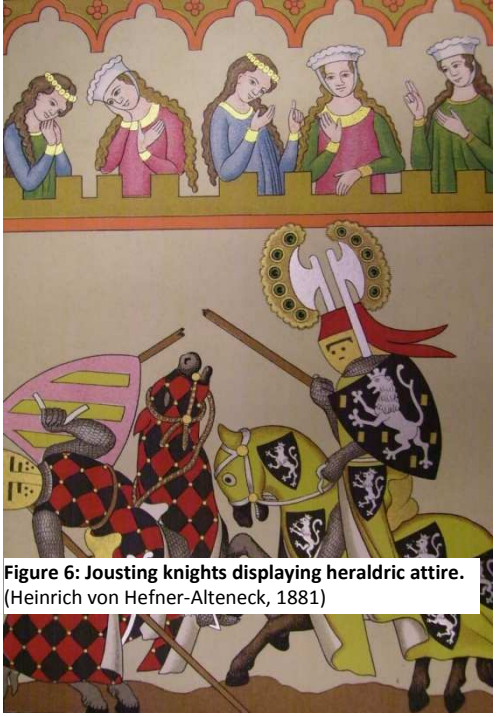

Figure 6: Jousting knights displaying heraldric attire. (Heinrich von Hefner-Alteneck, 1881)

Upbringing of the Knight

Pre-adolescence

Aristocratic status was inherited in a feudal society, and the knight was often the son of a vassal (any man under a feudal lord). It was also custom for a lord to have his eldest son knighted. The knight's position was more or less determined at birth, and the culturing that formed the knight began immediately thereafter. There were several reasons for which a child may have been chosen to become a knight. He may have exhibited great physical strength or mental power. By the time chivalry had been well set in place however, a knight was chosen almost exclusively on his heritage; as put by the Abbot of Bourgueil in the mid eleventh century, "because he was a knight's son, descended from a long line of nobles."[26]

As with any medieval child, assuming the child survived the birth in good health, the chosen boy was baptized by one of the priests at the family's church. The mother was very protective of her children, practicing a method of babying called *swaddling*, during which the baby was bundled up like a mummy for warmth and protection.[27] The babies were often breast-fed until the age of two. In the boy's first few years, he would learn manners and courtesy within the home. Though the boy may have been too young to learn to fight, it was never too early to introduce him to God and the chivalric code.

The greatest advantage the aristocracy held over the common class was education. What better way to maintain power over a group of people than to keep them uneducated? In fact, historians often argue that the German invention of the printing press in the very late Middle Ages was the most significant invention of the time period, because over time it allowed the poor to become educated. Therefore, it should come as no surprise that the value of education was fully understood even in earlier times. The young knight-hopeful began his training learning to read and to write as early as age four.

Somewhere between the age of six and eight, when most other boys would begin to learn the vital art of farming[28], the child would be sent away as part of what would become a long apprenticeship process. This had to be done early, because if the child were to become a knight, he had to become

[26] (Keen, 1984, 68)
[27] (Singman, 1999, 21-22)
[28] (Singman, 1999, 23)

hardened – something that could be inhibited by the forgiving nature of his family.[29] All the learning done by the child until he left the house to become a page occurred in the home, often with a family member as the teacher.

The Page Years

The first step in this process was becoming a *page*, or boy servant, to a lord or a knight. As a page, the prospective knight would serve as a waiter of sorts, running errands and tending to chores for his elder. He would learn to clean clothing and serve the lord's family at the table.

As a side effect of being a servant, the page would learn to cook, hunt, and became familiarized with the weapons and armor he may make use of in the future. He would also play games that built up his strength. The page also helped to care for the lord's horses. This provided the boy with early knowledge on how to ride and even to battle on horseback. The younger page would learn to ride a wheeled toy horse and hit a target with a pole. As the page grew more experienced and skillful, he was eventually granted the permission to ride a real horse and hit a wooden target.

The primary intention of this apprenticeship was not to build familiarity with arms and fighting, however, but rather to further enhance the boy's character, manners, and sense of loyalty. After all, a knight was more than simply a seasoned warrior. For an aristocratic male, his tenure as a page was often the only time in his life where he would learn skills that did not directly pertain to fighting.

[29] (Painter, 1953, 118)

The Squire Years

By the age of 15, pages were selected by knights to become the knight's personal apprentice. Thus began the true immersive training of the to-be knight; the page became a *squire*. The squire had the duty of tending to the armor, weapons, and horses of the knight. This transition process further hardened the boy into a man of chivalric character and loyalty. The primary difference from his page years was his setting. As a squire, he resided with a knight, whose primary function was fighting; the squire became quickly immersed in his future trade. He taught the squire to not only care for, but to put on and to wear armor. The knight practiced fighting technique with the squire, and taught him to use the various knightly weapons. Knights also taught their squires to ride horses in the context of battle.

Figure 7: Squire, training. (Dorling Kindersley)

But where the squire truly differed from the page was in his privilege to accompany the knight into battle. The squire not only took personal lessons from the knight, but he followed him into battle and studied his every move. In battle, he would carry some of the knight's equipment, and tend to the several horses the knight brought to battle. Once learned enough, the squire was even permitted to fight alongside the knight, which got him some valued on-the-job experience.

Dubbing of the Knight

A squire was ready to become a knight when he had fully mastered the skills required to do so. This time was not specific to an age, but often fell between the ages of 20 and 24. By this point, the squire had learned as much as he could from the knight for whom he apprenticed, and was strong – both physically and in character. Modern fictional film and literature tends to oversimplify the dubbing of the knight to a simple ceremony at which a king or queen taps a newly-turned 21 year old man on the shoulder and pronounces him a knight. Although a knight could be dubbed on the spot by his lord whilst in battle, this was a rare occurrence; the true ceremony of dubbing into knighthood was actually quite complex and ceremonial, and eventually undoubtedly Christian.[30]

One of the earliest counts of such a ritual was the knighting of Geoffrey the Fair of Anjou and 30 others in 1128 CE. It began with a bath, and concluded with King Henry I of England bestowing shields,

[30] (Keen, 1984, 64)

swords, and horses.[31] Not until the 1200s though did a ceremonial dubbing become custom. Pierre de Vaux de Cernay described the ceremony in 1214 as a "new and unheard of custom of chivalry."[32] This marked the institution of the dubbing becoming not only a celebration or an honor, but rather the actual process of becoming a knight. By the 1300s, the ceremony was certainly custom and its religious connotations were realized.

[31] (Keen, 1984, 65)
[32] (Keen, 1984, 75)

Arms of the Medieval Knight

Daggers, Grappling and the Medieval Knight

Grappling

Grappling and wrestling techniques are an important and often overlooked aspect of knightly combat. The use of weapons was more important against opponents at a farther range, but defeating a heavily armored opponent in combat required a detailed knowledge of wrestling and grappling.

What is known about Medieval wrestling techniques comes mostly from *fechtbuchs*, which were medieval fight manuals[33]. These manuals were meant more as guides or studying aides, with the real tutelage coming from hands-on training with a knowledgeable fight master. One important series of fechtbuchs that survives today was one written by a German fight master by the name of Hans Talhoffer. The Talhoffer fechtbuchs have little in the way of text, but the illustrations provide a detailed description of the techniques taught by Talhoffer. Other similar fechtbuchs exist, most dating from the mid-1300s CE up to the late 1500s. These books came from all over Europe, including Italy, Germany, Portugal and the Netherlands.

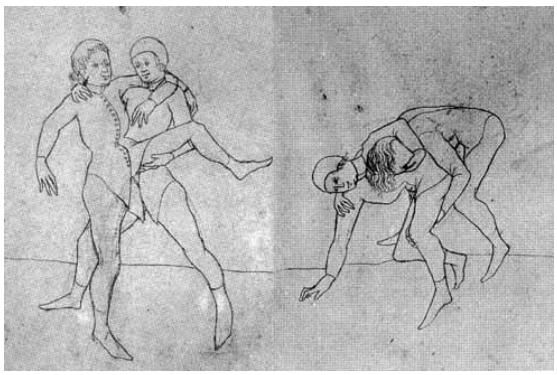

Figure 8: Ott Jud Wrestling Techniques in Talhoffer 1443 (www.thearma.org)

Unarmed hand-to-hand medieval combat is referred to as Kampfringen, which translates loosely as "Duel Wrestling". Kampfringen focuses on grappling, takedowns and throws, as well as other common wrestling techniques, and is not dissimilar to some modern mixed martial arts. Kampfringen is first described in detail by an Austrian master named Ott Jud who probably lived during the early 1400s. Ott believed that skill, quickness and a proper application of strength were the three most important factors in wrestling.[34] While not directly taught by Ott, later fight masters defined four distances used in Ott's techniques that need to be considered when engaging in combat wrestling. *No contact* is the

[33] (Norman, 1964, 97)
[34] (Tobler, 2003, 219)

farthest distance, and at this distance, opponents size each other up and prepare to engage each other. The next closest distance is *arm contact*. At arm contact distance, the combatant with the farthest reach is at a much greater advantage. Wrist, elbow and shoulder leverages could be used at this distance. Sometimes throws could also be initiated at this distance. Next was *the clinch*. At this distance, combatants close in and tried to reach around each other's body. Here most throws occur, as well as strikes to vital points. After a throw occurs, the combatants enter the closest distance, *ground fighting.* At this point pinning techniques on the ground are used against the combatant who was thrown. In his own writings, Ott separated wrestling into two categories: *By the arm* and *by the body*. Wrestling by the arm, which consisted of arms length techniques and arm-locks, was less complex and intricate than by the body.

While Ott Jud is one of the most important founders of Kampfringen, there were other contemporary masters who taught similar techniques, including Andre Lignitzer. Lignitzer was a German fencing master from the early 1400s. Lignitzer wrote a passage, included in the Starhemburg fechtbuch, in which he described 17 techniques with appropriate counter-techniques. The first ten techniques are by the arm techniques, and the remaining techniques describe by the body techniques, focusing mostly on throws.

While kampfringen focused on unarmed combat, *ringen am schwert* focused and wrestling and grappling techniques that could be used while engaging in armed combat. Ringen am schwert translates literally to "wrestling at the sword". These techniques focused on disarming opponents, attacking using other parts of the sword aside from the blade, such as the pommel, and attacking weak points in armor. The Talhoffer fechtbuchs presented many such ringen am schwert techniques. Some such techniques and disarms were adapted for fighters on horseback as well.

Figure 9: Ringen am schwert in Talhoffer (www.hema.freehomepage.com)

These techniques involving both armed and unarmed grappling were very important to the combat training of the knight, especially after the development of plate armor. Before the advent of plate armor, knights had to rely on mail for protection. While this offered some defense from swords and other weapons, it was still very vulnerable to piercing attacks. With the advent of plate armor, swords and edged weapons had no real effect. In order to actually incapacitate such an opponent, he

would need to be engaged in grappling and subdued so that a finishing blow or *coup de grace* could be delivered with the knight's most important close-combat weapon, the dagger.[35]

The Dagger

The dagger, very effective in close quarters, did not come into play as a knightly weapon until the late 1300s.[36] Before its use as a weapon of the knight, the knife was mostly a peasant tool that would usually only be used for combat if the wielder was pressed. A popular pre-1300s blade was the Anglo-Saxon *scramasax*, a single bladed weapon usually set in a wooden handle with little or no hand guard and no pommel. This weapon ranged from 3 inches long up to two and a half feet, with the average around 16 inches.[37] There was also a form of scramasax known as the *langseax* that was used as a weapon, popular with Norse spearsmen at the time. There were other daggers during this period that more closely resembled later double-edged daggers, but they were not nearly as popular.

During the 1300s, knights began carrying daggers along with their other weapons. This was a response to new developments in armor technology. With the advent of plate armor, knights had to target very specific weak spots in the armor, and the dagger was the perfect weapon for this.[38] In the Starhemburg Fechtbuch, master Andre Lignitzer described a set of eight dagger techniques, to be used depending on how the opponent was holding his dagger and the attacks which he used. Many of these techniques involved deflection of the opponent's thrusts. Knowledge of such techniques would be important for a knight to know when facing another similarly armored knight at a close range.

Figure 10: A Late 14th C. Baselard
(http://www.museumoflondon.org.uk)

It was during this period that knights began to carry quillion daggers, named for the curved quillions that made up the guard on the dagger. It was a double-edged stabbing weapon shaped like a

[35](Edge, Paddock, 1988, 125)
[36] (Oakeshott, 1960, 253)
[37] (Edge, Paddock, 1988, 36)
[38] (Oakeshott, 1960, 254)

small sword.[39] Also popular during the 1300s was the baselard, a somewhat larger weapon with a sideways-H shaped handle that resembled a short sword.[40]

Figure 11: 15th C. German Rondel
(www.todsstuff.co.uk)

By the 1400s, the rondel dagger had been developed. The rondel, named for its circular or octagonal guards above and below the grip, usually had a triangular blade which came to a very sharp point.[41] The blade did not have sharp edges and was meant to be used as a stabbing weapon, not a cutting or slashing weapon. An effective stabbing weapon was exactly what a knight would be looking for in a dagger to deal with heavily armored opponents, and as such the rondel became a popular choice for the knight. The Ballock dagger, a style of dagger similar to earlier quillion daggers, but with a much more simple hand guard, made up of two round kidney-shaped pieces, had begun to replace the rondel by the 1500s.

While some medieval illustrations depict the dagger as a weapon that would be used in tandem with the sword, this was not the case until around the end half of the 1500s. The dagger would usually only be used for coup de grace finishing blows or as a last ditch backup weapon when the sword was lost or broken, and was usually held with the blade pointing downward.

[39] (Edge, Paddock, 1988, 62)
[40] (Norman, 1964, 106)
[41] (Norman, 1964, 106)

Swords of the Medieval Knight

European swords before the 11th Century

The swords of Medieval Europe were greatly influenced by the Viking swords of the 11th century and earlier. The Vikings were known all along costal Europe as great warriors with serious martial prowess due to the many raids which they performed. Because of these interactions, the Viking sword styles became the basis of early European swords during the medieval period. To the Vikings, the sword was a symbol of great power, with warriors naming swords and passing them down through generations.[42] This idea of the sword as a symbol continued through the medieval period, and became entwined with the sword's importance as a religious symbol, with the sword representing a cross and the two edges representing truth and loyalty.[43] During this period, most swords came mass produced from relatively few sword-smiths in Europe. The best swords of the period were forged in a process known as "Pattern-welding".[44] Because high-quality homogenous steel was rare, the process of pattern-welding used both a strip of homogenous steel and a bar of wrought iron. The strip of steel would be bent upon itself to form a V shape and would be hammer-welded into place along the wrought iron bar, which formed the center of the sword. Depending on how it was forged, the bent and hammered steel would form different patterns down the blade, which could be accentuated using acid during the polishing of the sword. Such swords would have been up to 2 feet 6 inches long with a slightly rounded point.[45] These swords would often also have the name of the sword-smith chiseled into one side of the blade. Pattern-welding continued until around 1050, and was replaced with simpler techniques that could produce swords nearly as strong as pattern-welded swords.

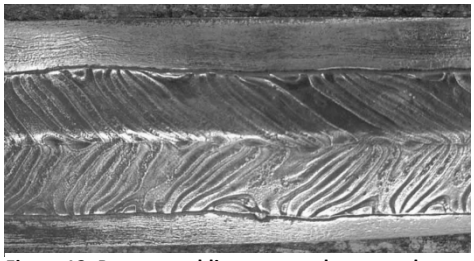

Figure 12: Pattern-welding on a modern sword (www.paul-binns-swords.co.uk)

[42] (Norman, 1964, 95)
[43] (Oakeshott, 1960, 204)
[44] (Edge, Paddock, 1988, 26)
[45] (Edge, Paddock, 1988, 27)

Swords in the 11th Century

By the 11th century, blades had started to become lighter and better at piercing, thus becoming more effective against mail armor. Hilts of these weapons had short cross guards, hand grips and usually a semi-circular pommel that provided enough weight to counterbalance the blade.[46] As the century progressed, these swords developed longer cross guards and "Brazil nut" pommels, as evidenced by the Bayeux Tapestry.[47] During this century, the sword started to become a religious symbol, and the side opposite the sword-smith's name sometimes had phrases such as "INNOMINEDOMINI" (In the name of the Lord) inscribed upon it. Scabbards from this period would have been worn on the left hip of the belt, and were made of two strips of wood held together with animal glue, wrapped in leather and lined with fleece.[48] Such blades remained popular until the 1200s CE.[49]

Swords in the 12th Century

By the 1100s CE, the sword continued to evolve into a longer, more slender blade. The sword had started to become more elegant in this period and now both sides tended to be inscribed with religious invocations.[50] The Brazil nut pommels from the previous century started to become rounded. Disc pommels began appearing in the south of the continent and slowly moved north and west. Pommels of this period were usually made of iron, but were sometimes made of bronze and semi-precious stones. Some swords even contained holy relics in their pommels, further defining the sword as a holy weapon. This idea of the sword as a holy weapon really exploded in this period due to knights returning from the first crusades, and longer straight quillions became popular, giving the sword a cross shape. Swords in the 1100s CE were still one-handed cut-and-thrust weapons with blades usually between 25 and 30 inches.[51]

[46] (Edge, Paddock, 1988, 27)
[47] (Norman, 1964, 97)
[48] (Edge, Paddock, 1988, 28)
[49] (Oakeshott, 1960, 204)
[50] (Oakeshott, 1960, 205)
[51] (Edge, Paddock, 1988, 47)

Swords in the 13th Century

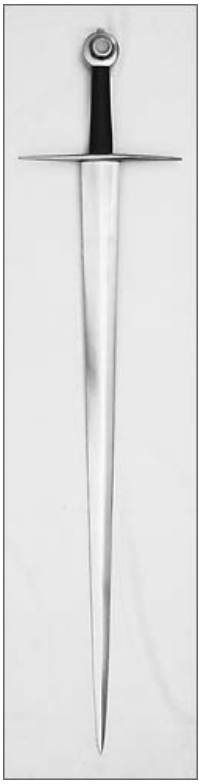

Figure 13: An Arming Sword (www.chicagoswordplayguild.com)

During this period, larger blades, known as "swords of war" or arming swords, started to appear. These swords were similar to older Viking swords but with a more acute point.[52] They had a very thick disc pommel which was important to counter-balance the larger and heavier blade, which tended to be between 40 and 42 inches.[53] The increased weight of swords in this period was due to the development of solid armor and the great helm. These armors could not be easily pierced like chain mail, so knights needed a weapon that could have great cleaving power. Towards the end of this century, swords designed for piercing began to develop. Also towards the end of the century, swords were supplemented with the falchion, which was an effective cutting weapon whose blade widened towards the point.

By the late 1200s, there was a split in the development of swords. The arming sword was a single-handed weapon, with the other hand able to hold a shield or buckler. At the same time, there were new swords, which developed into the longsword, which required two hands to hold. These swords were primarily designed for thrusting, but could also be used for cutting attacks. The arming sword continued to be popular, but for knights, the longsword proved to be much more useful.

Swords in the 14th Century

The piercing swords that had begun developing during the late 1200s CE continued to be refined during the 1300s CE. These swords had a sharp point and a diamond shaped cross-section with no groove.[54] These piercing swords also incorporated a "ricasso". The ricasso was a blunt edge on the blade of the sword that started at the base and continued up for about an inch and a half. A finger could be wrapped around this blunt edge to give the wielder greater control over the point of the sword. These piercing swords also had an elongated pommel in the shape of a fig or "scent bottle".[55] This longer pommel allowed both hands to be used to deliver a more forceful piercing thrust. The "swords of war" from the previous century still continued to be popular alongside this new form of sword. These

[52] (Oakeshott, 1960, 206)
[53] (Edge, Paddock, 1988, 62)
[54] (Norman, 1964, 98)
[55] (Edge, Paddock, 1988, 87)

swords were given longer grips so that they could generate enough power to cleave off limbs. Also during this period sword that had both a very sharp point and wide at the shoulders were becoming popular and the falchion remained popular as a cleaving weapon.

The estoc, a weapon designed specifically for use against chainmail and plate armor, was also popular during this period. The estoc was a variant of the longsword with an average length around 4 and a half feet with about a 3 foot blade. This weapon had no cutting edge, and had a triangular or diamond-shaped cross section with a sharp point used for piercing vulnerable points in armor. In some ways, this weapon was analogous to a rondel dagger, in that both could only be used for thrusting attacks.

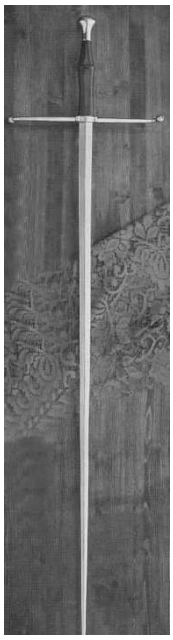

Figure 14: The Estoc (http://www.georgehernandez.com)

Swords in the 15th Century

The cut-and-thrust weapons from the 1300s and previous centuries remained popular during the 1400s CE, now with blades between 28 and 40 inches, cross guards that inclined downward towards the point and single handed grips.[56] The thrusting swords that had been developed in the previous century had now become extremely popular. This increased popularity was mostly due to more refinement of armor technology. The newer plate armor was making the "sword of war" less and less effective and the new thrusting swords were perfect for attacking weak joints in armor with precision that a larger sword could never reach. These piercing swords were also further refined to have a larger ricasso for more control over the point of the weapon. By the end of this century, the cutting "swords of war" had become much more ceremonial, and was more of a status symbol as developments in armor had made it less useful in battle.[57]

Also during this period, short swords became more popular for infantrymen and foot soldier, replacing knives and daggers. In Italy, short swords started to have modified quillions that formed a knuckle bow, offering some protection to unarmored infantrymen.

[56] (Edge, Paddock, 1988, 124)
[57] (Norman, 1964, 105)

Sword fighting Techniques

While details of early sword fighting techniques are somewhat sparse, it is believed that fighters would tend to trade blows back and forth, either catching them on a shield or dodging them.[58] In London during the late 1200s and 1300s CE, schools of fencing were outlawed, but still most likely existed. On mainland Europe, masters of arms had formed guilds to teach swordplay. Schools such as the Fraternity of St. Mark in Frankfurt taught swordplay, training in other weapons and wrestling until the late 1500s CE. Fechtbuchs such as the Starhemburg Fechtbuch and the Talhoffer Fechtbuchs described the use of single-handed swords, double handed swords, wrestling with swords, as well as different styles, guards and many other intricacies of sword fighting.

In the Starhemburg Fechtbuch, the first section, consisting of Johannes Liechtenauer's poems on longsword combat from around 1350 and explanations from about the 1400s, describes techniques to be performed using a longsword in unarmed combat. He describes several different cuts, as well as guards parries, chasing and a number of other techniques that can be done using a longsword. In subsequent sections, Andre Lignitzer describes techniques with the sword and buckler, and armored combat with the half-sword, a term used for a style of knightly fencing where combatants hold the sword by the handle and the middle of the sword.

For each weapon and combination, descriptions of the techniques used in fighting are very detailed, and probably pale in comparison to the amount of detailed training a master could give to one of his students in person. Clearly, mastering any one of these weapons would take a great deal of training and persistence.

[58] (Norman, 1964, 97)

Blunt Weapons and Polearms of the Knight

The Mace

The mace, while seemingly one of the simplest weapons of the knight, was a very popular weapon during the medieval period, and carried almost as much symbolic weight as the sword. The mace had been around long before medieval times. In the Bayeux Tapestry, depicting the Battle of Hastings in 1066, two styles of mace can be seen.[59] One was a simple wooden club with a heavy head. The other was a slimmer mace with a metal trilobite head that would later develop into the all-metal maces. By the 11th c. the mace had became a symbol of rank similar to the sword. The mace changed little until around the 1100s CE, when it was given a flanged metal head.[60] These flanges were metal protrusions from the mace head and were especially effective at piercing armor. By the 1200s, the mace had started to become more popular due to its ability to crush supplementary defenses. It had a head made of bronze or iron and a wooden shaft up to 3 feet in length.[61] There were also larger, two-handed versions available during this time. During the 1200s, the mace head began to be constructed from steel and now had a heavier flanged head. By the 1400s, the mace had become a fully metal weapon, constructed from iron or steel, weighing between 2 and 4 pounds and measuring between 20 and 24 inches.[62] These maces were lighter than maces in earlier periods and had disks at the bottom of the shaft to protect the hand. By the late 1500s, the mace was becoming a less important battle weapon and was more popular in tournaments. During the periods where mail was popular, the mace was an effective and somewhat popular weapon.[63] When plate armor was developed, the sword became much less effective than it had been in the past and the heavy flanged mace, with its ability to dent or even punch right through plate armor, proved to be very effective against this new armor. It also delivered a concussive force that could sometimes stun an opponent.

Figure 15: Example of a flanged mace head (www.medieval-weaponry.co.uk)

The War Hammer

[59] (Edge, Paddock, 1988, 32)
[60] (Norman, 1964, 117)
[61] (Edge, Paddock, 1988 63)
[62] (Edge, Paddock, 1988, 128)
[63] (Edge, Paddock, 1988, 12)

The war hammer was another blunt weapon that first used in the late 1200s onward by foot soldiers or un-mounted knights.[64] This early war hammer was a simple weapon with a head of iron or lead, often with a spike protruding from the top and a fluke on the back, mounted upon a shaft. The first war hammers were short, with a length similar to that of a mace. The head of this short war hammer was usually a two inch by three inch square usually separated into four slightly spiked sections. On earlier short war hammers, the length of the shaft was between two feet and two feet six inches.[65] On both these smaller war hammers and on the larger weapons, there was usually a metal strip running down either side of the handle to help reinforce the weapon and protect the handle from being split apart. The weight of this weapon was similar to that of a mace, usually between 2 and 5 pounds. The weapon could deliver a great deal of concussive force or the wielder could attack with the fluke on the back of the weapon, which was effective at punching large holes in armor. These short war hammers remained popular as secondary side arms through the 1400s. In the later periods, the short war hammer was mostly used on horseback, with the longer, polearm hammers used on foot.

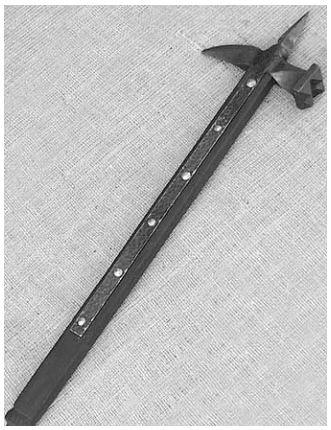

Figure 16: A Short War Hammer (luksavat.tripod.com)

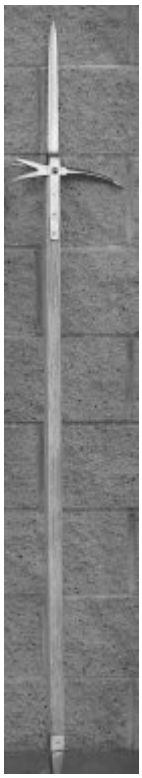

Figure 17: A Bec-de-corbin (www.mwart.com)

By the 1400s, war hammers with longer handles, influenced by the popularity of other polearms such as the halberd, had been developed. These long, polearm war hammers came in many different variations. Most consisted of a 4 to 6 foot shaft on which was mounted some combination of beak, hammer and axe head.[66] These weapons also usually had small spikes mounted on the top and bottom, sometimes with a round guard near the bottom of the weapon to protect the hand. This family of weapons was commonly called the "pollaxe" or "ravensbill", although these really referred to more specific subsets of the family. Despite the unwieldy appearance, these weapons could be very swift and the length of the weapons allowed for a great deal of power to be delivered to an armored opponent. The greater length also made the weapon very effective at knocking off mounted combatants. These weapons were used

[64] (Tarassuk, Blair, 1979, 449)
[65] (Edge, 1964, 43)
[66] (Edge, Paddock, 1988, 127)

both for battle and for tournaments.[67] Besides decoration, these weapons evolved little from their conception.[68] By the late 1500s, this weapon had become more popular in tournaments than in battle and had become more ornately decorated.

Figure 18: A Lucerne Hammer
(www.trocadero.com)

Some of the most popular variations of the polearm war hammer that were popular during the 1400s were the bec-de-corbin and the Lucerne hammer.[69] The bec-de-corbin was a war hammer whose name, in French, means "crow's beak". The top of the weapon consists of a hammer head on one side and a beak-like fluke, from which the weapon gets its name, on the other side. The top and bottom, like most other pollaxe warhammers of the time, are affixed with spikes or sometimes, on the top of the weapon, a short blade. The hammer could be used to deliver a powerful concussive blow, while the fluke on the other side could pierce a shield or armor and the spikes could be used to drive into weak points in a suit of plate armor. The Lucerne Hammer was a similar weapon, but with a spike on the back of the weapon instead of the fluke-beak and a longer spike atop it.

Other Polearms

All of the previous polearm war hammers owed a great deal to earlier polearms, which, while not knightly weapons, had a great influence on medieval combat and weapons of the knight. The earliest polearms were spears, which became the early medieval pike. The pike consisted of a small, diamond shaped head atop a long ash pole.[70] These weapons were effective both as a defense against charging cavalry and used in an offensive charge with a group of infantrymen. This weapon remained popular through the 1400s. While there were many variations of early polearms that developed from the pike, the most popular was the halberd family. The halberd, which became popular during the 1300s and 1400s, was a long polearm, up to 16 feet, upon which was mounted an axe head with a fluke or spike on the reverse side, topped with a spike.[71] The axe head of this weapon could be used for cutting, the spike on top for thrusting, especially into weak spots in armor, and the fluke on the back of the weapons could be used for to hook riders and pull

Figure 19: 16th C. halberd
(Higgins Armory Database)

[67] (Edge, Paddock, 1988, 128)
[68] (Norman, 1964, 118)
[69] (Norman, 1964, 118)
[70] (Norman, 1964, 111)
[71] (Edge, Paddock, 1988, 89)

them straight off of their mounts. These weapons, held forward like pikes, could also be used by a line of infantrymen to push back charging knights. It is important to note that the introduction of the halberd did not hinder the popularity of the pike. In fact, the pike was still the preferred weapon for defense against mounted soldiers. There were many variations of the halberd, many with different shaped heads or other combinations of spike, fluke and axe head. It was from the popularity of these weapons that many of the previous war hammers, such as the bec-de-corbin emerged, so many knightly weapons owe a great deal to these earlier infantry weapons.

Ranged Weapons of the Medieval Period

The Longbow

The longbow was never a knightly weapon, but it was one of the most important weapons of the later centuries of the medieval period. The bow had been a popular weapon long before the start of the 11th century, and its effectiveness was already known all throughout Europe.[72] Archery was a longstanding Viking tradition and as they settled in parts of mainland Europe, including Normandy, they passed on this legacy. Archers, both on foot and mounted, were prevalent in early medieval battles such as the Battle of Hastings. At Hastings, most of the archers were not professional soldiers, and this is a trend that continued into later periods as well. Despite the popularity of these bows, especially in Northern Europe, they were much less effective than the later longbows of the 1300s and 1400s. These bows tended to be a great deal shorter, and were only pulled to the chest, as opposed to the corner of the mouth on later bows. Despite the prevalence of these bows in the early medieval centuries, traditional close range fighting techniques were still the most effective way of waging war.

Figure 20: Archers at the Battle of Hastings (Bayeux Tapestry) (www.regia.org)

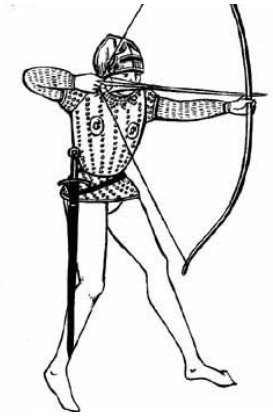

Figure 21: An English Longbow-man (Centre de Jeanne d'Arc)

By the 1300s, this had begun to change. During the English civil wars, the longbow, which had become a national Welsh weapon and was being used by both sides, was noticed by Edward I.[73] The longbows that developed from the earliest Welsh bows tended to measure between six feet and six feet and four inches. The front of the bow was flat, and the back rounded, making a 'D' shaped cross-section. The wood used for the bow was birch, ash, or sometimes oak. The middle of the bow would be wrapped in yarn and coated in beeswax for about a foot to serve as a hand grip. The arrows used in these bows had developed from earlier hunting arrows, which had broad arrowheads. The longbow arrows measured between 30 and 36 inches.[74]

[72] (Edge, Paddock, 33)
[73] (Norman, 1964, 122)
[74] (Edge, Paddock, 1988, 89)

The longbow arrows had thinner, needle-pointed heads which much more effective at piercing both mail and even plate, so long as the bow was fired at a range of up to about 70 feet.

The rate of fire of these bows was greater than any other ranged weapon of the period, and an experienced archer could realistically fire 18 arrows per minute. The range of the longbow was also much greater than crossbows or other ranged weapons of the period, up to 400 yards. Experienced arches usually used bows with pull weights between 80 and 150 pounds.[75] During large battles, the use of the longbow was less about accuracy and more about rate of fire. Longbow-men would fire in groups, arching their arrows upward and covering a target area. Becoming an experienced archer could take years and English citizens were encouraged in statutes to practice archery regularly, even up into the Elizabethan era.

Edward III saw the destructive force of these bows firsthand and adopted them in later fights against the Scots in the 1330s.[76] When the Hundred Years War started, the French were not expecting the power of these bows and taken by surprise in early battles such as the battles at Agincourt and Crécy. The dominance of the English longbow lasted for about another century, until the French gained the upper hand by developing cannons during the mid-1400s. The English longbow was still used despite this up until the 1600s.

The Crossbow

Another popular ranged weapon of the medieval period was the crossbow. While it did not have as great a range as the longbow nor as great a rate of fire, the crossbow did have some advantages that led to its popularity. One was that the crossbow was much easier to learn how to use than a longbow and did not take nearly as much strength to use. A second was that, at close range, a crossbow had a higher penetrative capability than a longbow.[77] Despite some of the advantages of the longbow, it was not often used outside of England, and the crossbow was the popular choice on continental Europe. Like the bow, the crossbow was in use before the medieval period, and was brought to England by the Normans. By the 1300s, the crossbow usually had a stave, the curved bow

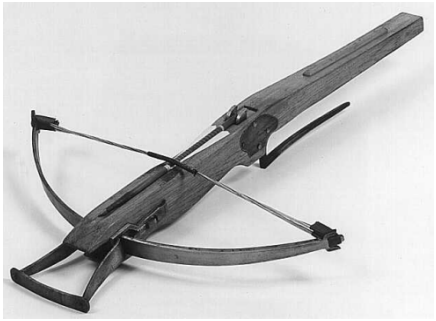

Figure 22: A Crossbow with a Steel Stave (www.by-the-sword.com)

[75] (Edge, Paddock, 1988, 89)
[76] (Oakeshott, 1960, 282)
[77] (Edge, Paddock, 1988, 91)

piece, which was made of a composite of horn, wood and sinew. This material was sometimes replaced with steel by the mid-1300s, making the crossbow much more powerful. This stave was mounted upon a stock fixed at a right angle to the bow.[78] A mechanical device would assist the archer in pulling back the drawstring, known as spanning. These started as simple winding mechanisms but developed into more complex geared systems that would allow for a much greater draw weight. While spanning could be somewhat time consuming, soldier in the field were often protected by large personal shields known as 'pavise'.[79] Once the string was fully drawn back, it would be hooked behind a revolving cylinder, called a nut, attached to the stock, and could be left this way without putting strain on the archer's arm. A trigger, under the stock, could be pulled to release the arrow. The arrows used in a crossbow were both shorter and lighter than longbow arrows and usually had a square cross-section at the head. These crossbow arrows were known as 'quarrels' or 'bolts'. The crossbow remained a popular weapon on the European continent until the rise of reliable firearms.

Gunpowder Weapons in the Medieval Period

Firearms and cannons, which began to be introduced by the late-1300s and 1400s, were a great equalizer on the battlefield, even more so than the longbow or crossbow. With these new weapons, the knight was no longer less likely to be killed than the other, less well protected soldiers. While heavy plate armor could withstand early firearms from certain distances, even the best armor could not fully protect a knight from artillery fire.

Figure 23: A firearm being fired from a stand, 1400
("Belli Fortis", manuscript, by Konrad Kyeser)

Hand guns from the early 1400s looked similar to miniaturized cannons. A metal barrel, usually iron or bronze, would sit atop a shaft. This shaft would be put under the arm and the gun would be set off by using a hot wire or a slow match.[80] By the mid-1400s, these handguns had become smaller and more compact, now resting against the chest instead of under the arm. Now a 'serpentine lever' would hold the match, and the gun could be fired by moving this lever forward, igniting the gunpowder. A lock

[78] (Norman, 1964, 125)
[79] (Norman, 1964, 128)
[80] (Edge, Paddock, 1988, 130)

developed towards the end of the 1400s continued to improve the firearm and made firing even easier. The bore of these guns was between $^{5}/_{8}$ and $^{7}/_{8}$ inches.[81] The shot was made of either cast-iron or lead. These weapons had a range of up to 200 yards, but could neither match the accuracy of longbows nor the rate of fire as reloading of firearms was cumbersome.

By the end of the century, this weapon had become extremely popular, with armies having hundreds of hand gunners. Through the next centuries, firearm technology improved further, and modern firearms, such as the musket-like arquebus, were invented. It was these technologies that spelled the end of the knight.

[81] (Edge, Paddock, 131)

The Medieval Horse

The Horse

A horse is a perissodactyl; a mammiferous quadruped that has lost four toes, retaining only the third (middle) toe, protected by a nail called a hoof. As the prehistoric evolution of the horse is traced, the only missing link in the evolutionary chain is the five toed ancestor. Roughly sixty million years have elapsed between the earliest known member of the horse family hyracotherium or Eohippus, and the modern equus caballus. This time gap covers fifteen million horse generations (with the age of sexual maturation being approximately four years), and thirty species covering two million years each.[82]

In the early Eocene epoch, we can identify the root of all modern horses, the Eohippus. It was a four toed ungulate, and it was about the size of a small fox. The fossils of the eohippus have been found in the Americas as well as in Europe. The world went started to cool in this period, and the habitat of the eohippus changed from a sweltering swamp forest to solid ground, with many conifers and grasses. In America, we see the next step in the evolutionary chain, the Orohippus, which had considerable changes in its denture, allowing it to more easily eat grass, now that deciduous trees and shrubs were less plentiful. The Orohippus bears a great resemblance to the Eohippus.[83]

Geological Epoch	Time Period
Eocene	Approximately 60 to 40 million years B.C.E.
Oligocene	Approximately 40 to 25 million years B.C.E.
Miocene	Approximately 25 to 10 million years B.C.E.
Pliocene	Approximately 10 to 1 million years B.C.E.
Pleistocene	Approximately 1 million to 8,150 years B.C.E.

Table 1: Geological Epoch - Time Periods

At the beginning of the Oligocene, it is believe that all equines were extinct. In the Americas, there existed three toed ungulates, the Epihippus, Mesohippus, and then the Miohippus. These animals

[82] (Gianoli, 1699, 9)
[83] (Isenbart, 1970, 36)

were larger than the orohippus, and were better suited to the grassy plains that replaced the American forests.[84] In the Miocene, a descendent of the miohippus, the merychippus, crossed a land link at the Bering Strait, to make an important migration. These horses developed into the Hipparion during the Pliocene epoch. The Hipparion had three toes, but only one rested on the ground, the other two were small vestigial digits. The Hipparion is believed to be the ancestor of the onager, the African wild ass, and the zebra.[85]

The other ancestor of modern equids also is descended from the merychippus, though it evolved not in Europe, but during the American Pliocene. This was the Pliohippus, which was the first equine monodactyl, and of all the modern horse's descendents, had the closest extremities and denture. The Pliohippus was the largest equid to date, standing at over 42 inches tall.[86]

The pliohippus took two evolutionary tracks, but since all traces of American horses had disappeared by eleven thousand years before the arrival of Europeans to the Americas, only the Equus Przewalskii is worth following. In the Pleistocene Epoch, the Equus Przewalskii crossed the Bering Strait and spread throughout Europe, Asia, and Northern Africa. It was the Equus Przewalskii that has become the modern horse, through centuries of selective breeding, turning into many diverse domesticated varieties.[87]

The diversity of the Equidae is the result of influences from climate, the nature of forage and soil and by the nature of work in the domesticated state. With changes in feet came simultaneous evolution of the dental structure, older species fed on tree foliage, and more recent species on herbage. In humid areas where grains and grass grow to tall heights, the growth of horse stature and long hair is favored. In desert areas where water and herbage are separated by great length, light structure is encouraged, allowing the horse to get from one water or food source to another very quickly.[88]

All modern horses are descended from three major horse strains, with each strain identified not only by appearance, but by a geographic location. The Mongolian strain was located around southern Siberia and the Mongolian plateau, with angular, thick set features and a sedate temperament. The Aryan strain was from farther west than the Mongolian strain, on the steppes of southern Russia. The

[84] (Gianoli, 1699, 10)
[85] (Isenbart, 1970, 37)
[86] (Isenbart, 1970, 38)
[87] (Zuener, 1963, 300)
[88] (Gianoli, 1699, 10)

last example of this strain is the recently extinct tarpan. It is this strain that the Indo-Europeans used in India, and later in the Mediterranean and Mesopotamia. The Aryan horse has fine features, an agile body and impressive musculature. The European horse has a low stature, large width, with a very heavy body.[89]

Horse Domestication

At first, the horses served primarily as a source of food to early man. Horses could not be domesticated until man had the tools to domesticate them. The resources necessary to domesticate a horse include not only a place to keep it and a way to control it, but patience as well. If Stone Age man cannot construct a corral how can he keep a horse? Paleolithic man did not know how to braid, so he could not lead or lasso a horse. It was not until the Neolithic period that the knot was invented.[90]

The Sumerians tamed onagers and asses as early as 2600 BC, as the Standard of Ur depicts a four wheeled cart driven by long eared equines. A seal found in Kish, depicts a four wheeled cart pulled by four galloping horses, this is also dated around 2600 BC. As early as 2000 BC, Sumerian leaders are found in armored cars pulled by horses. These cars were typically four wheeled carts.[91]

It was the Hittites and Mitanni that turned the Sumerian armored cart into the chariot. A Hittite chariot carried three passengers, a driver, a passenger with a bow and a lance, and a passenger with a shield and a lance. They had perfected them to the point that they were able to use eighty of them at the siege of Urshu at about 1600 BC.[92] In fifteenth century BC, one of the first horse care books was written, "The Training of Horses". It was Four Clay tablets written in cuneiform by Kikkuli, a Mitannese master riding Instructor. It is a detailed book about the breaking, acclimatization and training of horses. The text recommends that horses be trained for 148 days of progressive work, and describes the stable management, operation, quality and quantity of food and dressage for each day. The horses are selected by a trial gait, and then are exercised in blankets to help them lose weight. The exercise gets progressively harder as the time passes.[93]

[89] (Gianoli, 1699, 9)
[90] (Gianoli, 1699, 11)
[91] (Gianoli, 1699, 13)
[92] (Gianoli, 1699, 14)
[93] (Zuener, 1963, 319)

The Chinese had, up until 300 BC used the horses that were available locally, which were of Mongolian stock. This changed during the reign of Wu-Ti of the Han Dynasty who had the traditional Bow and javelin replaced with a two-edged sword and lance for mounted combat. The heavy Mongolian horse was interbred with the tarpan or an Aryan horse, resulting in a horse with a fine head, arched back, large neck and muscular hind quarters.[94]

The Greeks did not have the horse until the 16th century BC, and the horses most likely came from Egypt, as the artifacts of the period show horses with Mongolian features. The horses in Egypt were Mongolian horses left by the Hyksos. The Greeks originally used the horse for draft work and also as a pack animal. The Greeks introduced horse racing, adding an event for quadrigos or four-horse chariot to the XXV Olympiad (680 BC). A race for saddled horses was added to the games in 564 BC. Simon of Athens and Xenophon both wrote books about horses. Simon of Athens wrote how horse color had no bearing on the quality of the horse, and recommended a body type similar to an Arabian horse. Xenophon wrote on horse care, horse selection, horse grooming, horse training and horse equipment.[95]

The Celts had horses of the European type, short, fleshy, broad and heavy. They were mostly used for draft, but also for combat.

For several hundred years, the Romans considered the horse auxiliary equipment for war. Eventually, when cavalry became a necessity, riding schools became widespread. Men and women in Rome had different riding styles. Romans were considered the best horse breeders of their time, but not the best horse riders. They instituted public registries for studs, containing their characteristics, bloodline, wins and other information about their racing careers. Quality horses had a right to burial and had stele recording their exploits. Roman equestrian competitions included races for two horse chariots, quardrigas, and six, eight and even ten horse chariots. Talented charioteers became major celebrities in Rome, and the best charioteers became fabulously wealthy.[96]

The anatomy of a horse can be divided into four major divisions, the head, neck, legs and trunk. The head contains the sensory organs and brain of the horse. The head serves as a counterweight, allowing the animal to maintain its balance as its center of gravity shifts while the animal moves. A

[94] (Gianoli, 1699, 17)
[95] (Gianoli, 1699, 25)
[96] (Gianoli, 1699, 41)

horse never breathes through its mouth, always through the nose. Modern horse breeders look for many features in a race horse. A good head is lean and light, has small, erect, alert ears, large and dilated nostrils, and large eyes. A horse's head should be oriented at forty-five degrees with respect to the ground. A horse with a more obtuse angle has a "head to the wind". A horse with a more acute angle has a "drooped" head. An ideal horse's forehead is straight and flat. If the ears of the horse are too close together, the horse is considered "hare headed". If the muzzle is too narrow, the head is considered "conical". If the profile formed by the forehead and nose form a convex profile, the horse is considered "mutton headed", if the profile is concave then the horse is "pug nosed", if the profile is extremely concave then the horse is "dish nosed".[97]

[97] (Isenbart, 1970, 190)

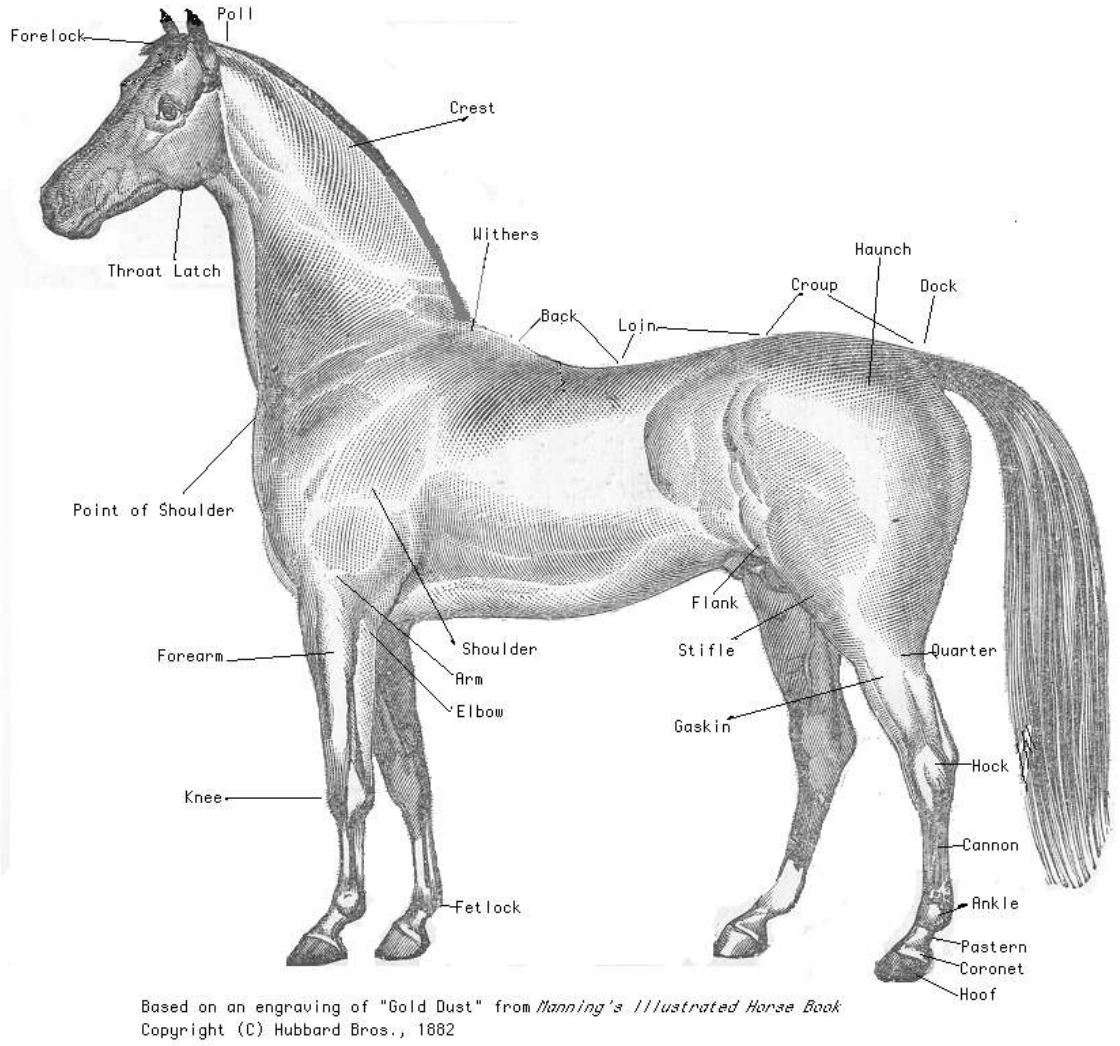

Figure 24: Anatomy Diagram (Hubbard Bros. 1882)

On the horse, between the loins and wither is the trunk or barrel. The wither is the highest point on the horse's back, where most of the forehand muscles are connected. It is located on the ridge between the horse's shoulder blades, and is formed by the bulge of the first dorsal vertebrae. The barrel houses the majority of the horse's internal organs. If the dorsal line is too concave, the horse is considered "sway-backed". If the dorsal line is too convex, the back is a "roach" back. A good dorsal line is approximately horizontal to the ground, and is higher that the rear of the horse. The loin, which is located near the lumbar vertebrae, and is from the last rib of the horse to the croup, should be short.[98]

[98] (Gianoli, 1699, 422)

The forelegs meet the body of the horse at the shoulder; passing down the leg are the forearm, knees and the fetlock. The knees of a horse should be bony at the sides, but flat in front. The cannon or the space between the fetlock and the knee should be broad. The rear leg meets the body at the haunch; passing down the leg is the quarter, then the gaskin, which is a muscle similar to the calf. The hock is the tarsus or joint on the hind leg.[99]

Horses can be separated into three "blood" types. A hot blooded horse, like the Arabian or thoroughbred, is an intelligent horse that learns easily, which makes it easy for it to pick up bad habits. A warm-blooded horse is one that is bred to accomplish any task, from sporting to agricultural work. A cold-blooded horse is a draft animal, bred for hard work.[100]

Horses are prey animals by nature, grazers that typically flee when frightened. They are herd animals, which exhibit very social behavior. In the wild, feral horses follow the leader of the herd, a boss mare.[101]

The Saddle

The average modern horse weighs between 900 and 1200 pounds, and its center of gravity shifts depending on its gait. The rider represents an increase of about 15-20% of the horse's weight and has his own center of gravity as well. This introduces many stability problems for the rider if he rides bareback. For this reason the horse was used as a means to get to a battle instead of a vehicle to fight on during the early centuries after horse domestication. To increase the rider's stability the saddle cloth was invented. It was a padded length of fabric that sat on the horse's back, which provided cushioning for the rider and also a layer of protection between the sweaty back of the horse and the rider.

A saddle is the seat that is secured to the horse's back. The saddle can be split into several parts, the tree, the seat, the pommel, the cantle, the stirrup, the flaps, and the cinch. The tree is the base of the saddle, the tree of modern saddles is made of wood and metal, or just a lightweight alloy. Traditionally, the tree is made of wood. The cantle is the back of the saddle. The pommel is the front of the saddle. The seat is the area where the rider sits, and it is lower than both the pommel and cantle.

[99] (Gianoli, 1699, 429)
[100] (Gianoli, 1699, 42)
[101] (Gianoli, 1699, 421)

The cinch is the strapping that holds the saddle to the horse. The stirrup is loop that hangs on a strap from the saddle, serving as a footrest. The flaps connect the stirrups to the tree, and act as a barrier between the horse and the rider's legs.

The stirrup is seen in use first in India in the second century BCE. It then immigrated to China, before passing into Constantinople where it was incorporated into the byzantine cavalry in the reign of Emperor Maurice in the late 600s CE. The Byzantines had used the saddle since the fourth century, and that saddle had evolved over six centuries from the saddlecloth. The stirrup added a large amount of stability to the saddle, removing the rider's feet from the path of the horse.[102]

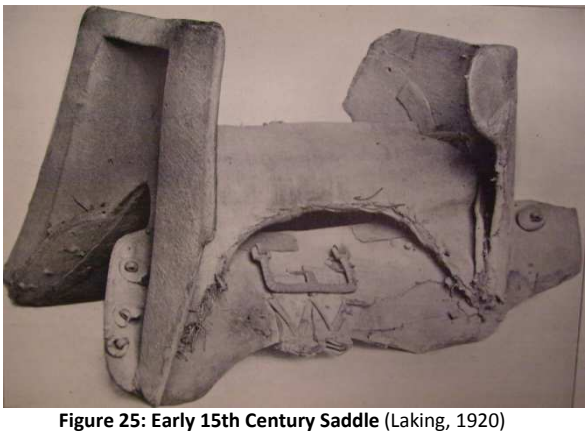

Figure 25: Early 15th Century Saddle (Laking, 1920)

The knight would rest in a saddle called a selle à piquer or spurring saddle. The pommel and cantle formed a deep cradle which allowed the knight to securely sit so that he could resist the shock of impact. The tree was built to support both the rider and his armor.[103] Towards the end of the 14th century, it became common for the cantle and pommel to be plated with steel. By the mid 16th century, the stirrup evolved into a boot stirrup, which had a steel toe cap. The stirrup was essential to the knight, as it allowed him to stay in the saddle while using his weapons.[104]

Caring for the stirrups and saddle is very important. In Bem Calvagar, it is recommended that the stirrups be as wide as possible, as that means that it would take more force to tear through them. The stirrups should be firmly secured, and the stirrup should be neither too tight nor too loose around the foot, about nine to eleven inches. The saddle should be appropriate to the horse and to the rider in both size and strength.

[102] (Gianoli, 1969, 54)
[103] (Gianoli, 1969, 83)
[104] (Blair, 1958, 185)

To be effective the saddle must lie below the withers of the horse, or it will disrupt the horse's movement. The tree cannot interfere with the shoulder of the horse for the same reason. The tree has to be positioned so that the weight of the rider is evenly distributed, otherwise abnormal points of pressure will develop, and these points will injure the horse.

The Spur

The spur is a device that is connected to the rider's boots that allows the rider to direct the horse's movement. Two major types of spurs were seen in the Middle Ages, the rowel spur and the prick spur. The prick spur was a conical spike fastened to the footwear; the spike was terminated early by a ball or molding which prevented the spur from going too deep into the horse. This type of spur was very popular until the rowel spur replaced it, in the mid-fourteenth century. The rowel spur replaces the spike with a wheel of spikes, which was either fixed in place, or which rotated around a central axis.

Figure 26: 11th Century prick spur (Dufty, 1986)

Figure 27: 15th Century rowel spur (Dufty, 1968)

The spur serves as an aid, and is used in conjunction with verbal commands. If they are used improperly, the horse can become unresponsive to them. The spur has three major parts, the yoke, shank and the spike or rowel. The yoke is the band that attaches to the heel of the rider; the shank is the length of metal between the yoke and the spike or rowel. The spike or rowel is the part that makes contact with the horse. Modern spurs typically contain rowels, but some have round or knob ends. Modern spurs are much milder than medieval spurs.[105]

In Bem Calvagar, the advantages and disadvantages of both kinds of spurs are discussed. The rowel spurs were considered more aesthetically pleasing, and more humane, because the spurs do not wound the horse as deeply as the prick spur. However, it is noted that with long enough rowel spikes, it is possible to provoke the same reaction that the horse would have to prick spurs. Prick spurs were considered to be the best all around spurs, and appropriate for every sort of horse. For horsemen who rode with their legs extended, it was necessary for the shank to be long, as it had to reach the horse's flanks.

[105] (Blair, 1958, 185)

The Bridle

The bridle is another piece of equipment that is used to direct the horse. It is a harness that fits over the horse's head, secures the bit in the horse's mouth, and is attached to the reins. The bridle is made up of a crownpiece, throatlatch, cheek-pieces, browband, and noseband. The crownpiece holds the bridle in place, by anchoring it behind the ears of the horse, the throatlatch is part of the crownpiece, and it rests under the horse's throat to hold the bridle securely. The cheek-pieces attach to the crownpiece and the bit, running along the cheeks of the horse. The browband is fastened to the cheek-pieces and crown piece, running along the forehead, under the ears. The noseband keeps the jaws of the horse closed, preventing it from opening its mouth wide enough to ignore the bit.

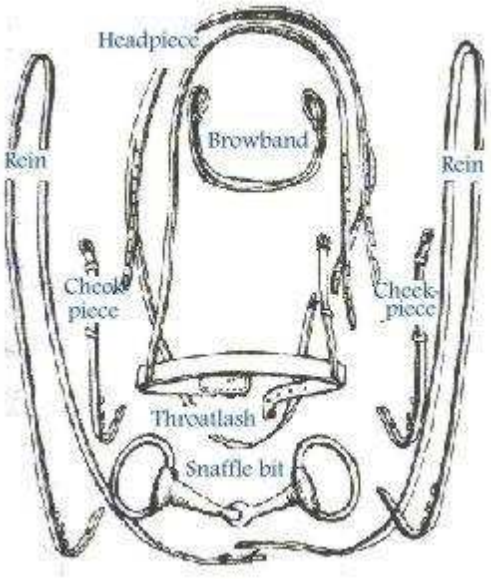

Figure 28: The bridle and snaffle bit dissected
(http://www.equiworld.net/uk/horsecare/saddlery/bridle.JPG)

The bit is a piece of metal that lies in the mouth of the horse, in a region that contains no teeth. It creates pressure on the tongue or roof of the horse's mouth which allows the rider to direct the horse. When properly installed, bits cause the horse no pain, however even very mild bits can cause pain if improperly installed. The curb bit is a leverage bit, with a bar that has a circular expansion. Any pressure applied to the bridle applies pressure on the horse's mouth. The snaffle bit is a like a curb bit, but with a jointed mouthpiece, it is considered much less harsh.

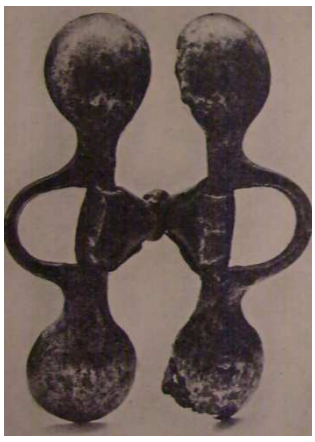

Figure 29: 13th century snaffle bit
(Laking, 1920)

Figure 30: 15th century curb bit (HAM)

Xenophon described and recommended the use of two bits, a soft type with little wide disks and a hard bit, with a sharp, pointed mouthpiece. He believed that the horse should be trained with the hard bit, so that the horse would be more receptive to the soft bit. Xenophon's bits differ from modern bits, since the rein was connected to only two rings or hooks; there was only the need for one set of reins, and no snaffle or curb. The bridle is attached to the ring, and when force is applied to the reins, the little disks press up on the tongue, forcing the mouth open. In the middle ages, the bit became a sort of level with a plate that pressed down on the tongue when the reins were pulled, and the cheek-pieces sometimes reached eight inches, these closely resemble the modern curb bit. In the high renaissance, double bridles became commonplace. They used both a snaffle and curb bit, with the four reins necessary.[106]

The Horseshoe

The horse is an ungulate monodactyl; it has one toe on each foot that is protected by a nail called a hoof. Much like the nails on a human hand or foot, horse hoofs are made of the protein keratin. When domesticated, horses lack the nutritive additives necessary to keep the nail tough. To help the horse out, the horse is shod. The Romans had used horse and mule sandals, which were metal sheets tied to the horse's hoofs using leather straps. The nailed horseshoe reached common usage in Europe in the 10th century.[107]

Barding

After 1250 CE, protection for the horse's head, or chanfron, was used. This was at first leather, but eventually was made of steel or iron. It was decorated in a similar manner to the rider's helmet. Mail horse armor can be seen in the art of the mid 14th century. Plate horse armor was in use by the end of the century. At first only the metal chanfron, and a chest protector called a peytral were used, by the end of the 15th century armor was added to protect the rear of the horse and the neck of the horse.

Figure 31: Early 16th century German iron chanfron (HAM)

[106] (Gianoli, 1699, 25)
[107] (Isenbart, 1970, 87)

It was not uncommon to add pieces of armor to the reins of the horse, to make it harder for enemies to cut through them. The armor that protected the rear of the horse was called the crupper, the examples that remain today are steel plates riveted together. The neck protection was overlayedmetal sheeting called a crinet.[108]

Figure 34: Early 16th century peytral (Dufty, 1968)

Figure 32: Early 16th century crupper (Dufty, 1968)

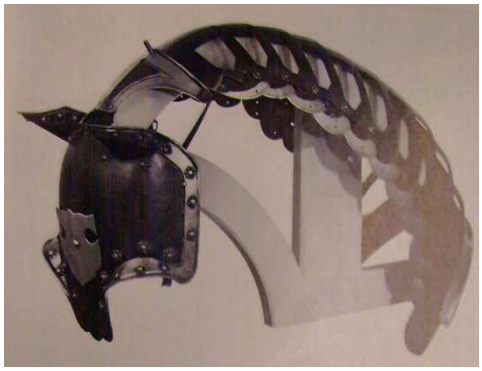

Figure 33: German chanfron and crinet from the mid 16th century (Dufty, 1968)

Horsemanship

In order for a horse to be suitable for a knight, it needed to be of a certain quality. It needed to be tall, strong enough to carry a heavily armored man at a gallop, and sturdy enough to bear wounds and not flee at the clamor of battle. It had to be agile, brave, and steady while being aggressive and

[108] (Blair, 1958, 185)

intelligent. A horse like this is not easy to find, and warhorse breeding and training necessarily became a major industry in the Middle Ages.

In the early middle ages, the horse was used primarily as a means to maneuver around a battle. The rider would leap on and off the horse to fight on foot. To practice mounting and dismounting, a wooden horse was constructed. A knight would practice mounting and dismounting unarmed, with a sword and shield, and with a heavy polearm. This taught the knight to learn how to leap on and off the saddle. Towards the end of the 11th century, the high cantle and pommel clearly indicate that the knight was no longer jumping on and off his horse to do battle, but rather taking and delivering blows on the horse.

The training for horsemanship and mounted combat began in childhood. By the time that the future knight reaches the age of 8, he leaves to serve in the household of a more powerful lord. There he learns to care for horses, and the basic horse riding skills necessary for combat. These include jumping in and out of the saddle without touching the stirrups, unarmed and while fully armed, and hitting a target with the lance couched. The training target is called a quintain. It is a target on a crossbar, which swings around on impact. On the other end of the crossbar is a sandbag. If impact causes the knight to stop, he will be knocked off the horse by the sandbag.

A Knight and his horse were very expensive to maintain and equip. In the mid 13th century, a term arose that described the mounted knight, his equipment and his assistants. The term was Lance Garnie. The knight's retinue contained two to four mounted archers and a squire. The squire's job was to help the knight into his armor, as the armor was far too heavy for the knight to wear all the time. Since the lance became so heavy, the knight only carried it into battle. The saddle with the high pommel and cantle which was used in the 14th century did not have a fewter to rest the lance upon, so the lance was carried by a squire. It was stored in boxes or bags, and carried by a packhorse. A horse was also used by each of the archers. Since the knight desired to keep his destrier or rouncey fresh for battle, he would ride a palfrey or similar horse to the site of the battle. The warhorse was not ridden except in battle.[109]

As the protective ability of armor increased, so did the weight that the horse needs to carry. The size and weight of the warhorse changed very dramatically over the centuries. The size of the best

[109] (Carless, 1989, 35)

warhorse in the 11th and 14th centuries would have been much different. The warhorse was heavy, and in battle or tournaments it would carry over 400 pounds. The horse was expected to quickly turn and perform complicated maneuvers. To prompt the horse to perform, very strong bits and long spurs were used. The horseman sat upright in the saddle, and drove the horse mostly with motion from his legs. The style of riding depended on the style of saddle that was used. A knight's charge was not a gallop; instead it was a trot or amble. This is because the vertical motion caused by galloping made the lance very difficult to aim.[110]

The Medieval Horse

There were many different categories of horses for the medieval rider to choose from. They varied in price, quality, purpose, weight and size. The destrier is a knight's horse, and is believed to be the forerunner of the modern draft breeds. It was capable of carrying the knight, his armor and his weapons. In the 14th century, the destrier reached heights up to 18 hands, or 6 feet from the ground to the withers. The destrier was rivaled only by the palfrey in price. The destrier was bred for strength and size, but not endurance. It allowed the knight to get large amounts of power behind his lance, but was not great for long battles. The destrier is considered a cold blooded horse.

The palfrey is a riding horse, an ambler, with a very smooth gait. The amble is a gait which is faster than a walk but slower than a canter. It doesn't displace the rider or equipment that it may carry, as opposed to the normal trot of a horse. It was highly prized and used for riding and hunting. It was ridden by nobles, ladies and knights who could afford it. Hunting was a popular pastime for nobility in the middle ages. Deer, boars, foxes, bears, and badgers were all hunted on horseback.

In comparison to the destrier, the courser is a much lighter and faster horse. It was valuable, but also was less expensive than the destrier. The courser was a very powerful horse, and was useful in battle as well as hunting. The courser contains Arabian blood, and also could descend from the Northern African horses, and the courser was considered warm blooded. Since the courser was strong, fast and light, it was a good horse for long battles.

[110] (Gianoli, 1969, 83)

The rouncey was an all purpose horse, it was used in the Middle Ages as a pack horse, riding horse, and occasionally as a war horse by the poor knights who couldn't afford better. The rouncey was nothing special, and was not nearly as specialized as the destriers, palfreys or coursers.

The Joust

There were many activities and contests that occurred on horseback. The most famous of these contests was the joust. The joust occurred when two knights charged at each other with lances couched. Depending on the rules of the joust, the knights aimed to either unhorse the opponent, or to hit the some target on his opponent. The type of lance head also depended on the type of joust. For a tilt, long pointed heads were used. The weapons of the joust also depended on how the joust was meant. There were jousts of peace and jousts of war. In the jousts of peace, safer equipment replaced the more lethal weapons. If the knight's purpose was to unmount the opponent, he would use pronged head, or a coronall head.[111] This allowed the lance tip to hook itself into the opponent's armor and push him out of the saddle. The jousting took place at the lists, an enclosure that was surrounded by a stadium. In the French or deal joust, there was a wooden barrier separating the knights. The jousting targe was a small shield affixed to the shoulder of the knight, on the opposite arm from which he used the lance. For some knights, the expense of specialized suits of armor was too great, and they became professional jousters.

For the joust, the ideal horse was the destrier; they were heavier horses, and allowed the knight to get more force behind the point of his lance. A jousting horse would wear a chanfron, and a decorative covering called a caparison, which would show the knight's heraldry. Some horses also wore additional barding. The saddle used in tilting did not have the high cantle that a saddle meant for war did.

The Lance

The lance was originally a throwing spear or javelin. It evolved from a throwing weapon used by the roman legion to a multipurpose mounted weapon in the early middle ages. Coming out of the dark ages, the spear was the cheapest and easiest weapon to make and use. This made it the most common weapon. Originally, the lance could be used in four ways. It could be held over the head and thrown,

[111] (Isenbart, 1970, 120)

thrust downwards like pig sticking, thrust upwards to force a mounted enemy out of the saddle, or held couched. The spears of the Dark Ages were around six and a half feet, which was far too short to hold couched with any sort of effectiveness.[112]

By the 12th century, the lance was more that 10-12 feet in length, and the broad spear point became narrower. The body of the lance was still that of a spear. In the beginning of the 14th century, the lance had already been equipped with a hand guard called the vamplate, and a plate that prevented the lance from going backwards called the grapper. In the fifteenth century, the lance swelled around the hand, and tapered off towards the rear and front ends.

The lance used in tournaments was much different than the lance used in war. It was not uncommon for lances to be hollow or jointed, allowing them to shatter on impact.

[112] (Paddock, 1988, 69)

Armor of the Medieval Knight

Armor Pre-1400

Mail

The development of the medieval knight's armor found its underpinnings mainly in Roman influence. At the beginning of the medieval period the typical armor was based around a coat composed of interlocking iron rings known as mail. Approximately 35,000 - 40,000 rings were required to construct an Alamanic coat of mail which had short sleeves as well as a hood[113].

The basic piece was the *hauberk*, a shirt-like coat of mail designed to protect the torso and provide limited protection to the arms. Henry II of England declared in 1181CE: "Let every holder of a knight's fee have a *hauberk* (lorica) a helmet, a shield and a lance."[114].

The *coif*, a cap of mail, may have been part of the *hauberk*, or a separate piece entirely. *Mufflers*, essentially mittens of mail, were produced for hand protection, and may have been linked directly to the sleeves of the *hauberk*. Additionally, mail leggings called chausses provided protection for the legs. Mail leggings were mentioned as early as the *Lex ribuaria* and so found at least some use around the sixth century. A complete set of mail may have weighed as much as 40 pounds. Mail was commonly worn with a surcoat (overcoat) which provided a means to display the coat of arms as well as some extra padding. The full set of mail armor donned with a metal helmet was typical of the 1200s[115].

Mail excelled as a defense against edged weapon attacks and early missiles where the increased surface area provided by the network of metal rings was sufficient armor. Hand-held spears or weapons such as the war hammer which relied on blunt trauma were good ways to thwart the defense mail offered. High-powered missile weapons like the longbow and crossbow were also effective against mail[116]. The mid 13th Century saw the addition of small pieces of plate to the full mail set of armor. The first use of plate armor improved protection of the knees and elbows and were called the *poleyns* and

[113] (Contamine, 1894 1984 throughout, 178)
[114] (Contamine, 1894, 67)
[115] (Blair, 1959, 23-32)
[116] (Pfaffenbichler, 1992, 8)

couters, respectively. It was these two pieces which sparked the evolution of mail armor to a full suit of plate armor during the 1300s[117].

Helm

In addition to mail, early medieval armor would also include some type of helmet, possibly a simple iron skull-cap or perhaps a more elaborate metal framework encased in leather[118]. The helm was an absolutely critical part of any armor. The general model for the early medieval period was the *spanghelm*, a simple hemispherical helm. By the end of the 12th Century, helms were more commonly being fitted with face guards. These additions eventually evolved into an all encompassing helm, called the great helm. The great helm was basically cylindrical in shape, covered the entire head, with only relatively small slits for eyes. The great helm was an upgrade from Roman helms with hinged plates[119]. A more practical helm for heavy battle was the *chapel-de-fer* which was similar in appearance to a kettle, resulting in the common nickname: kettle helm. The kettle helm was similar to the *spanghelm* with the notable addition of a brim which increased protection, but did not reduce visibility in the way a great helm would. Turnbull describes the slaughter of mail-wearing Swedes at Wisby in 1361:

Figure 35: Spanghelm (http://members.aol.com/annoratheaxe/spanghelm1.jpg)

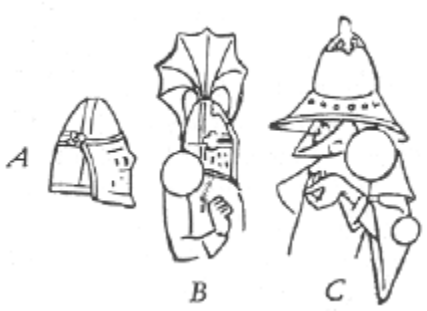

Figure 36: Different Types of Helm (Blair, 1958, 48)

"at least 125 men had suffered fatal headwounds from arrows and crossbow bolts which had struck their mail hoods. In many cases the arrowheads were found inside the skulls."

As armor increased in effectiveness and complexity, so too did the helms. The basic one-piece *spanghelm* and the great helm evolved into a multiple piece helm with finely crafted moving parts which combined the best qualities of the great helm and open helms like the kettle helm. As early as 1298 reference is made to a helm visor in the will of Odo de Roussillin.[120]

[117] (Blair, 1959, 39)
[118] (Contamine, 1894, 178)
[119] (Blair, 1959, 30)
[120] (Blair, 1958, 47)

During the period 1300-40 the helm was fitted with a *bevor* which protected the head below the sights.[120] The crest was also in use during this period throughout Europe. By the 1300s, the most common form of helm was the *bascinet*, which may have been paired with a plate *bevor*. In the mid 1300s the visor was commonly replaced with a thickly-padded triangular nasal piece.[121] By the late 1300s however, German armorers had replaced the nasal piece with a visor hinged in the middle. The general trend was for the *bascinet* to become more conical.

Shield

The shield was an important part of armor in the early medieval period, specifically before complete suits of plate superseded the shield as a useful defense on the battlefield. The shield typically would display the coat of arms and allow protection from ranged attacks. One of the common types of shield in the early medieval period was the *heater*, nicknamed the kite shield for its shape. This type of shield can be found in the Bayeux tapestry. The top of the shield was slightly rounded and the bottom tapered into a point. This design was useful on horseback and provided extra protection against crushing and ranged attacks to which mail armor at the time was poorly suited. Figure 37 shows *heaters* in use with full sets of mail armor. The knights depicted here are also wearing great helms. This drawing dates to about 1200CE Germany[122].

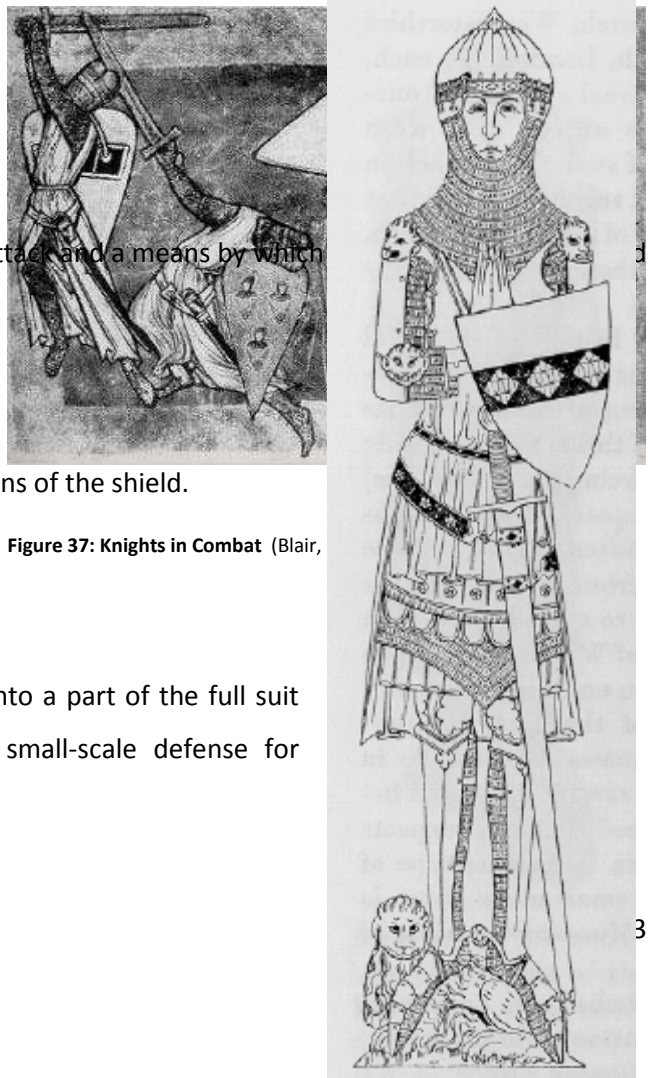

Figure 37: Knights in Combat (Blair,

Aside from providing protection from attack and a means by which [illegible] was of great social importance. The shield was a symbol of status and function; to abandon it was a disgrace. If the warrior died in combat, the body would be removed from the field by means of the shield.

Plate

Early medieval armor generally evolved into a part of the full suit of plate. Mail switched roles to become a small-scale defense for

[121] (Blair, 1958, 68)
[122] (Blair, 1972, 21)

particularly vulnerable areas of plate. The shield was driven to obsolescence by plate armor, which provided the protection of a shield without sacrificing mobility. With a suit of plate, the knight was free to use both hands. The mid 1200s marked the beginning of a technological revolution that would forever change the way history saw the knight.

Plates of worked iron over the *hauberk* were in use as early as the beginning of the 1200s[123] although the scarcity of examples seems to indicate that these were still fairly rare. A direct descendant of the plate armor breast and back plates (*cuirasses*) was the *cuirie* which appears in texts of the late 1200s. This body defense was probably made of durable leather called *cuir-bouilli*, which may be the origin of the term *cuirass* later given to plate armor defenses for the trunk[123]. The mid 1200s saw the marked addition of disc-shaped plates to the elbows and knees, as in the effigy of William Longespée the Younger[124], as well as shin guards over the *chausses*.

The next development was the coat of plates, which was constructed of many small plates attached to a cloth or leather garment. The common surcoat would have covered such a defense, so it is difficult to discern whether or not such a defense was in use from period illustration. Figure 38 shows a pivotal point in the transition from mail to plate armor. Note the leg and arm defenses tailored around a coat of mail and mail leggings.

Figure 38: Brass of Sir John de Creke (Blair, 1958, 41)

An armorers' ordinance issued in 1296 contains a description of plate *gauntlets* (hand defenses) similar in construction to a coat of plates. During the same time, neck and chin defenses of plate called the gorget or bevor were introduced. Defenses for the feet (*sabatons*) were introduced in the 1320s which consisted of articulated plates over mail shoes, similar in construction to the coat-of-plates. Plate defenses for the arms followed soon after similar defenses for the lower leg and feet and included the *vambraces* (which had an upper cannon: the *rerebrace* and a lower cannon: the *vambrace*) as well as shoulder defenses called *pauldrons*. Later the term *pauldron* would come to include the most upper part of the arm defense as well as the shoulder defense.[125]

Interestingly, during this time period, plate armor was still seen as an added defense for a full suit of mail. By c. 1330 illustrations of knights armored entirely in mail were quite rare[126]. The late 1300s saw the addition of metal hoops to the traditional construction of the coat of plates and later the

[123] (Blair, 1958, 38)
[124] (Blair, 1958, 39)
[125] (Blair, 1958, 44)
[126] (Blair, 1958, 41)

uppermost plates would be joined to form a crude breastplate. As metalworking skill increased to meet demand the breastplate and backplate came to be constructed of increasingly larger pieces of plate until the familiar breast and backplate pair (cuirass) emerged. During this evolution, it is difficult to discern at what stage the torso defenses were through illustrations because it was still the custom to cover this defense with a surcoat. A mature coat of plates might look nearly identical to solid breast and back plates under the surcoat.

After large metal pieces of plate became viable, one notable innovation was the stop-rib, which helped to stop an edged weapon from glancing past it into a more vulnerable area such as the neck. Lance rests also became more common, with a more substantial base with which to support the lance. Defenses for the extremities saw little change during this period, the bulk of which includes closer fitting and more highly articulated versions of their predecessors.

Armor Post-1400

Introduction – Textiles and Mail

Armor in the 1400s reached a level of sophistication and elegance never before possible. It was early in the century that the two great schools of Germany and Northern Italy emerged with distinct styles.[127] In general, the use of textiles and mail was reasonably similar between the two major styles. It is important to note that mail was indeed being used during this period. For the well-armored knight however, mail was mainly used as a supplement to sophisticated plate armor. Mail would have been attached to an *arming-doublet* to add protection where plate armor could not. Usually, these pieces of mail would consist of (i) a standing collar (*standard*), (ii) gussets (*voiders*) at the armpits and elbow-joints, (iii) a skirt typically covering down to the tops of the thighs.[128] The German school would have used tight-fitting mail breeches which came around to cover the genitals. The Italian school was more likely to have used a longer skirt which sometimes covered as far down as the knees.

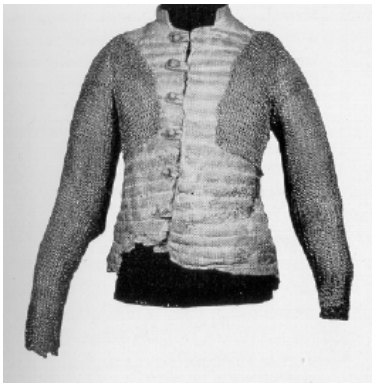

Figure 39: Arming Doublet
(Blair, 1958, 89)

The mail hood found some use, but more often it was replaced by a large standard and well-designed helm and fabric arming cap. The chin strap and *bevor* (plate neck defense) may have been padded, but the helmet was nearly always lined with canvas or some other textile to increase comfort and reduce chafing.

[127] (Blair, 1958, 77)
[128] (Blair, 1958, 78)

Italian Armor

Figure 40: Italian Armor (HAM 793.73 L 14a)

Milan was a well-established center of armor export by the 1400s[129]. It was around this time that Italian body armor had quite nearly reached maturity. In fact, the earliest homogeneous armor dates from c. 1420[130]. For the following years, the vast majority of changes in Italian body armor were nothing more than slight improvements on the basic form. This form included a rounded breastplate attached to which was a lower breastplate known as the *plackart.* The plate which covered the back was similar, with a main plate and an attached lower plate. The breast and back plates would have included a stop rib, designed to stop edged weapons from continuing up the armor into the neck or down the armor into the thighs or buttocks. As slight improvement, the breast and back plates would later each become one piece, attached to the other defenses with leathers or straps.

At this time, *pauldrons* (shoulder defenses) could be asymmetrical, with the left being larger and thicker for better protection on that side and the right being smaller to aid in mobility and weapon wielding. These also would have used the stop rib in order to stop edged weapons from glancing upwards into the neck and head. Field armor would generally have symmetrical *vambraces* (arm defenses) and *gauntlets* (hand defenses). The *gauntlets* differed from older styles in that they covered more of the hand with a hinged plate defense for the fingers. Even later forms of the gauntlet added a second articulation and thicker armor. *Gauntlets* would have been held together by leather strapping and the inside padded with canvas. Conversely, *greaves* (lower leg and ankle defenses) grew smaller to avoid directly covering the ankle and were sometimes entirely replaced by larger *cuisses*. Typically, the Italian school favored mail shoes rather than *sabatons* (plate armor for the feet), although this type of defense was not unheard of in later armors.

Some of the greatest changes and improvements affected early Italian helms. Sometimes these helms had visors, but generally the *celeta* and *barbuta* were a single piece of plate with a rounded skull with a comb, often pierced to hold a crest. The major difference was the

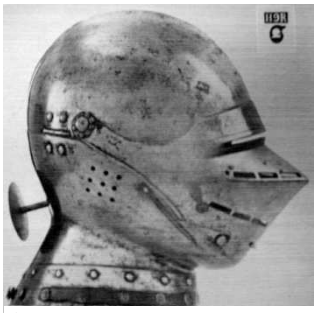

Figure 41: Armet
(HAM 739.73 L 14a)

[129] (Blair, 1958, 79)
[130] (Blair, 1958, 80)

opening for the eyes. One had a 'T' shaped opening, while the other had a smaller, arched opening. By the late 1400s, the Italian *sallet* appeared which had both open and visored versions. The armet was probably a derivative of the bascinet[131]. This type of helm had a pronounced crest, deep hinged cheek pieces and a small slit for vision. Figure 41 depicts an *armet* which serves as a good example of the aforementioned attributes. By the 1500s many of helms in use would fall into the *armet* category and were fitted with intricate visors and well-designed mechanisms by which to lift and hold them. As these visors became more effective, it was common to have a larger opening in the helm for vision and breathing, as the visor could be closed when protection was of the utmost importance and opened when vision and breathing were more important.

German Armor

The armorers of Germany were a few decades behind their Italian counterparts in the development of a full and uniquely German suit of armor. It was almost certainly Italian imported armor which helped to influence German armorers to create a rival style by the 1450s. In fact the evolution of *gauntlets* and *legharness* during the early 1400s were quite similar in both German and Italian armories.[132] A major sign of the German school's deviance from Italian style came early in the 1400s where the breastplate was more box-like and often fluted vertically or radially. The connective leathers common in Italian torso defenses were commonly replaced by a simple waist belt. The box-like features of the torso defenses declined later in the 1400s and one separating feature became a pronounced vertical ridge in the breastplate. By the late 1400s, the style became even more pronounced with a major emphasis on slender forms and large amounts of fluting on all parts of the armor.[133]

An important addition to the suit of armor which is seen first in the German tradition is the collar or *gorget.* This was a defense that clasped around the neck and extended over both the breast and back plates. The *gorget* was then used as a weight distribution system for the neck and head, and also as an attachment and support system for the *vambraces*. The elbows

Figure 42: German Armor c 1480
(Blair, 1958, 102)

[131] (Blair, 1958, 86)
[132] (Blair, 1958, 92)
[133] (Blair, 1958, 94)

and armpits were protected by large circular plates. The vambraces were, at their most basic level, similar to Italian styles but wings and fins of fluted plate were added, in accordance with the German tradition. Mature German *gauntlets* covered farther up the arm than Italian *gauntlets*, and never seemed to become pointed like the Italian *gauntlets*. *Sabatons* would have been attached to the *greaves* and were sharply pointed.

The helm of German tradition had similar origins to that of the Italian one, but the two styles deviated, if only for a century or so. German helms were based mainly on the *bascinet*, and the *great bascinet.* The *great bascinet* would have been actually attached to the torso defenses and would not have moved with the head the way a regular *bascinet* or *kettle helm* would. The *armet* of Italian styles did not gain popularity until the 1500s. The kettle helm was often turned down all the way around the head and became one of the most used. It evolved a small tail like a *sallet* but would have been quite noticeably German to an armorer of the time.

The Decline of Plate Armor

It was the 1500s which saw the major decline in mature plate armor. With improved weapons and improved enemies like the Swiss infantry[134] the knight in shining armor was meeting his match. During this time, the German and Italian schools of armor started to produce similar armor. Firearms posed a major threat to the well-armored knight. In their infancy, firearms could not penetrate a suit of armor. In fact, armorers were designing suits of armor with firearm attacks in mind. A suit of armor designed to defend against a gunpowder-based attack would commonly have been shot from a short range, and the resulting mark proudly displayed as a proof of quality.

Eventually, however the technology of the day made any effective armor prohibitively heavy and by the 1600s soldiers were casting off armor in favor of speed and agility on the battlefield. Generally, suits of armor were becoming more and more showpieces and were more heavily used in contests like the joust than on the battlefield. A suit of armor for the joust would have been very heavily constructed as compared with most of the previous centuries' battlefield armor.

[134] (Blair, 1958, 112)

Wearing Armor

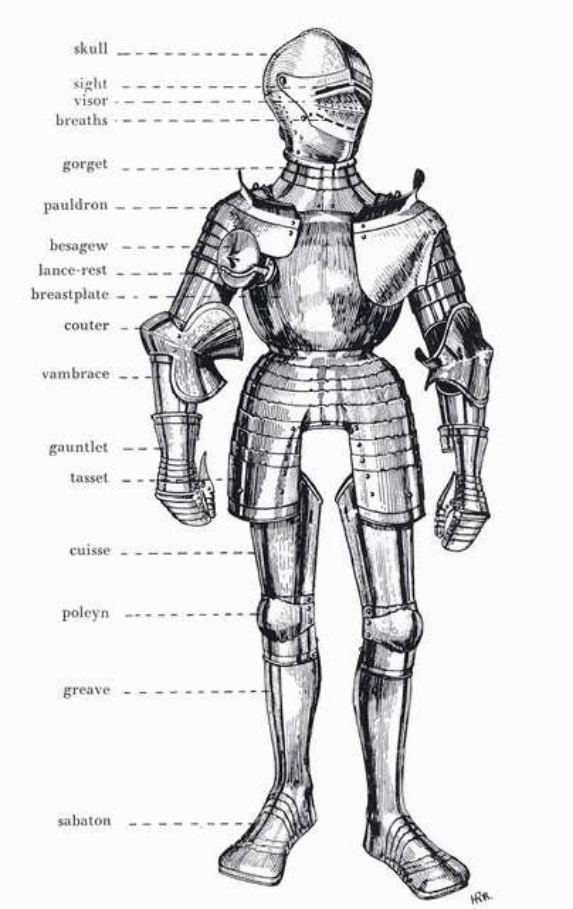

Figure 43: Armor Diagram
(http://www.artlex.com/ArtLex/a/images/arms_diagram.armor.lg.jpg)

Putting on Armor

A full suit of plate was sufficiently complex to require the help of squires in the arming process. A garment called the arming doublet would be worn under the breast and back plates; the sleeves would extend under the *vambrace* to the edge of the *gauntlet*. Woolen hose would be worn under the *greaves*, *cuisses* and *tasset* (See Figure 43). These textiles would have ties by which to attach critical points of the armor. The entire Arprocess would generally start from the legs with the *sabatons*, *greaves*, *poleyns*, *cuisses* and continue up the body. The back plate would be next followed by the breastplate. The *pauldrons*, *couters*, *vambraces*, *besagews* and *tasset* would then be added. The gauntlets and helm would have been donned just before battle. Modern attempts at recreation seem to suggest the process could be completed in fifteen minutes or less. Although a well-made suit of plate for combat would be heavy, it would not have been prohibitively so. Armed forces today are expected to carry as much or more weight in body armor and equipment. A suit for combat may have been as light as 40lbs; some suits for tournament weighed more than twice that. One surviving suit of German field armor from 1525 weighs 42lbs; a suit of Italian field armor from the same period weighs 45lbs. Another suit from the early 1500s designed for the joust weighs 90lbs. Clearly intended use of the armor had a big impact on its final weight.[135]

The so-called "Hastings" manuscript[136] describes in detail the order in which pieces were put on as well as an interesting list of items to bring to the battlefield. The passage is sufficiently succinct to warrant inclusion in the whole and follows:

[135] (Blair, 1958, 192)
[136] Hastings MS. [f.122b] (Translated from Middle English by Brian Price)

How a Man Shall be Armed at his Ease When he Shall Fight on Foot

He shall have no shirt upon him except for a doublet of fustian lined with satin, cut full of holes. The doublet must be strongly built; the points must be set at the break in the arm in the front and back. To lace the gussets of mail must be sewn onto the doublet also at the break in the arm and at the underarm.

The arming points must be made of fine twine like that with which men make strings for crossbows. These points must have tips for lacing. And they must be waxed with leather-workers' cord, such that they will neither stretch nor break. And he should wear a pair of hose made of worsted cloth. Around the knees should be wrapped ' bulwarks' of thin blankets to reduce the chafing by the leg harness. He should wear a pair of thick shoes, provided with points sewn on the heel and in the middle of the sole to a space of three fingers.

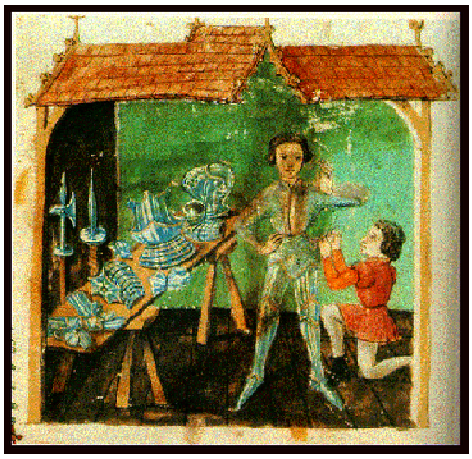

Figure 44: How a man Schal be Armyd (http://bp3.blogger.com/_9EG6MfRHzZY/Rwt4m37jwuI/AAAAAAAAA3w/xE1nCQ1OFBk/s400/armyd.gif)

To Arm a Man

First you must set the sabatons and tie them to the shoe with small points that will not break. And then the greaves and cuisses over the breeches of mail. Then place the taces upon his hips. And then the breast and backplates, the vambraces and rerebraces. And then the gauntlets. Hang the dagger on his right side, his short sword upon his left side in a round ring that it may be lightly drawn. And then put his cote upon his back. The bascinet follows, laced to the cuirass in front and back that it sits just so. And then his long sword in his hand, a small pennant bearing the figure of Saint George or Our Lady in his left hand. Now he is ready to take to the field.

What an Appellant Shall Bring to the Field

A tent must be put in the field
Also a chair
Also a basin
Also five loaves of bread
Also a gallon of wine
Also a "messe" of meat or fish
Also a board and a pair of trestles to sit his meat and drink on
Also a broad cloth
Also a knife to cut the meat
Also a cup to drink from
Also a glass with drink made
Also a dozen tresses of arming points
Also a hammer and pincers and a bichorn
Also a dozen arming nails
Also a spear, long sword, short sword and dagger
Also a kerchief to [hele] the visor of his bascinet
Also a pennant to bear in his hand during his avowing

One or more pages or squires would arm the knight in the fashion described above and make sure that he was comfortable, hydrated and well fed. Arming for battle was usually planned so that the pages or squires would not be rushed, though they would work quickly.

Fighting in Armor

Each suit of armor would have been tailor made for the knight. Although armor added extra weight, it was well distributed over the body and did not restrict freedom of movement to a great extent. A knight would have been expected to mount his horse without any help. The myth that a fallen knight would be as helpless as an overturned turtle is just that: myth.

Along with experience with well designed weapons, the knight would be expected to have mastered wrestling moves while armored. This kind of mastery requires a certain level of dexterity and range of motion which directly conflicts with the notion that the knight could not move freely in his armor (see Figure 45). Modern recreations with original suits of armor from the 1500s proved that even untrained men wearing a well-fitted suit of armor could mount and dismount a horse, lie on the ground and rise as well as move his appendages with ease[137].

Figure 45: Wrestling in Armor
(Paulus Kal, Fechtbuch)

When the full suit of plate became the norm on the battlefield, it was an extremely effective defense against ranged attacks and edged weapon attacks. War hammers and other blunt weapons were effective against plate if used to destroy a joint or some other vulnerable point in the armor. Thrusting weapons which allowed for fine control over the location of the blow also were effective against the joints of the armor. As ranged weapons progressed however, the crossbow and later gunpowder weapons were cause for concern, even for a fully armored knight.

Aside from the direct threat of enemy attacks, the knight would also have had to worry about heat exhaustion and hampered breathing. When a complex helm was completely closed, airflow and

[137] (Blair, 1958, 191)

vision would have been noticeably restricted. Reduced airflow coupled with a sweltering suit of armor were two concerns for the armored knight. Bradford marvels at the endurance of the knight:

> *"It is one of the mysteries in the history of armour how the crusaders can have fought under the scorching sun of the East in thick quilted garments covered with excessively heavy chain mail."*

Shakespeare addresses the situation[138] and describes Majesty as:

> *Like a rich armour worn in the heat of day,*
> *That scalds with safety.*

Even with these drawbacks, the full suit of armor, well- designed weapons and training made the knight an extremely powerful force on the battlefield.

Armor Production

Metal

The process of turning iron ore into workable steel came about almost naturally. The fuels used to melt iron ore for wrought iron introduced carbon to the mix. Steel is simply an alloy of carbon and iron. Adding heat and fuel to the equation would make the mixture even steelier. It's important to note that the "steel" of the medieval period was not as refined as the steel of today. Better steels and better methods for hardening and working steel were absolutely critical for the migration from mail-based armor to plate-based armor. Because steel was the ideal material for armor, the carburization process became more refined as the need for mass quantity of plate armor increased. Also, steel may have been a limiting factor to the production of armor. Steel was highly prized for its ability to be hardened and tempered, two of the main processes used in quality armor making.

[138] Henry IV, Pt. 2 (4, I, 104)

Mail

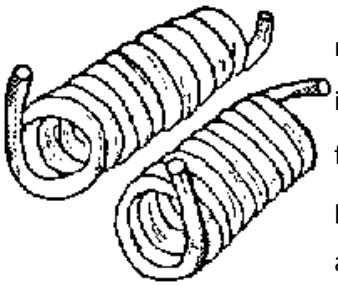

Figure 47: Formed Wire for Ring Construction (http://homepage.ntlworld.com/trevor.barker/farisles/guilds/armour/mail_f05.gif)

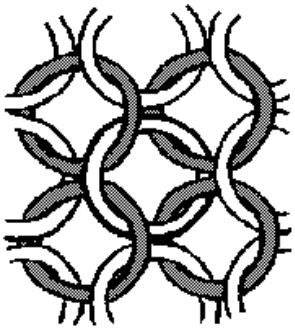

Figure 46: Mail Layout (http://homepage.ntlworld.com/trevor.barker/farisles/guilds/armour/mail_f02.gif)

The exact techniques employed by medieval armorers are not known, but inspection of surviving pieces and illustrations from the period provide insight into the process. Mail would have been arranged according to the pattern in Figure 46. Each link has four others passing through it. Each row was constructed out of wire which was rolled around a form and then flattened and riveted. Before 1400, the rings in alternating rows of mail would have been punched out of a thin sheet of metal.[139] The other rows needed links which could be threaded into the punched rings. Forming the wire and stamping the closed rings may have been the job of a less skilled armorer or assistant, whereas the actual linking and riveting would have been performed by an experienced armorer.

Plate Armor

The manufacture of plate armor in medieval times was dependent on flattening billets of steel. The flattening of a billet would have been achieved either by hand with hammers or by a water-powered tilt-hammer.[140] After a large piece of metal was flattened sufficiently, it would have been sheared to the correct dimensions and then formed on one of many specialized anvils, called *stakes.* Nearly all of the shaping was performed hot[141]. Cold work included adding fluting or details, as well as adjustments made to be sure that each piece of armor within a suit would fit and work well.

Figure 48: Cold Work (http://www.oakeshott.org/images/max.jpg)

Heat Treating

Heat treating armor was a critical step in creating strong, hard armor. The process specifies that the steel

Figure 49: Polishing (http://www.oakeshott.org/images/met3.jpg)

[139] (Blair, 1958, 20, 188)
[140] (Blair, 1958, 188)
[141] (Williams, VOL 10. 198, 80-102)

be heated until the metal is bright orange and then quenched (cooled quickly in water) to lock in the crystalline structure of the steel. At this stage the steel would be very hard, but also too brittle to be useful in battle. The next step would be to temper the steel by heating it again to a lesser heat and then quenching in a more viscous medium like oil or brine instead of water. This whole process yields a relatively light, very strong and hard suit of armor which was critical to the knight's survival.

After the suit was shaped properly, all of the pieces would be polished. Figure 49 shows a large production line of polishers. After the pieces were fitted and polished, fastening mechanisms like hinges and hooks were added. In general these fasteners were purchased in bulk from locksmiths, but for a high-priority client like a knight, special care may have been taken to custom-make such devices. [142]

Completed suits made in bulk were sold in large quantities. Although the knight would have his own suit custom made, the sheer number of suits being produced in the early 1500s was impressive. A large order for Henry VIII in 1512 consisted of:

> *2,000 complete harness called Almayne ryvettes… accounting always a sallet, a gorjet, a breastplate, a backplate and a pair of splints for every complete harness at 16s. a set.*[143]

The Knight's Armor

A great deal of armor was made with a one-size-fits-all mentality, but the medieval knight would have a fitted suit made specifically for him. Naturally, these fitted suits demanded a higher price and provided higher quality protection for the wearer. It was common for an armorer to travel a long distance to take measurements for a wealthy client. The armorer would construct a fabric suit to use as a model for the armor size and shape. This model would be used to construct a well-fitting and tailor made suit of armor. The benefits of a well fitted suit of armor included increased range of motion and better protection. A client who required a custom-made suit of armor was in the market for the very best materials and final suit of armor.

The Armorer's Mark

Suits of armor typically were stamped with the mark of the armorer who made them. Despite the overwhelming presence of these marks, only a few have definitively been linked to armorers. Two other common marks are the view mark and the arsenal and government marks. The view mark

[142] (http://oakeshott.org/metal.html)
[143] (Letters and Papers of Henry VIII, 1862, 415)

consisted of an entire or partial coat of arms and indicated the geographical origin of the piece. The arsenal and government marks would associate the suit of armor with a particular government and arsenal where the armor was stored. The knight would keep his own armor, and would not require this kind of record keeping.

Conclusion

In preparation for the video documentary, the project team researched the medieval knight through the writings of modern experts and the manuscripts of ancient masters. This research served as a solid foundation on which an accurate, informative video documentary could be built. The script for the video documentary represents the most interesting and accessible information from our research. The audio content includes narration from one member of the project team, original background music, and creative commons period music. The visual content is a collection of film from present and past project team video shoots, images from a number of period documents as well as photos of artifacts and reproductions. This project team is proud to present a professional video documentary on the arms and armor of the medieval knight.

Access to the work of previous teams allowed the project team to spend more time refining and polishing the finished product, rather than worrying about administrative details. Style and layout for the research document was largely influenced by the work of previous teams. Forming a plan of work for the term of the project was much easier with the benefit of previous teams' experience. A large database of images from the Higgins Armory Museum provided the team with images for the video documentary as well as a great way to browse artifacts from similar time periods. These images allowed the project team to gain a sense of these artifacts that would have been impossible from words alone. Footage from previous projects was used, not only directly in the video documentary, but also as an example of lighting schemes and actor placement.

Tasks were divided based on the preferences and abilities of each team member. The team members often worked independently, collaborating when appropriate. An online group allowed the team to keep track of the numerous versions of each document and provided a record of correspondence. This informal style of managing the workload worked particularly well. Because each of the team members had previously worked with one another, the team was comfortable with each member's style and approach. Previous experience with video and sound capture and editing was extremely useful. A project of this scope would not have been possible with fewer than four members.

The project team is able to make several important recommendations for future teams. The ATC is a fantastic resource for filming and sound equipment, but it is imperative that all equipment and media be tested before each shoot. A single piece of bad media or malfunctioning equipment can render the efforts of an entire shoot useless. Proper lighting is extremely important for good quality video capture. Make time to test lighting conditions, including a dry run or two. Play back the footage

to verify that the lighting is correct. The viewfinder, LCD screen and final footage will all differ slightly in the interpretation of lighting. When in doubt, slightly less light is better than more. Footage can be lightened after the fact; washed out footage simply cannot be fixed in post-production. There is an enormous amount of work from past teams which will be useful; check these sources first when looking for information, images, or video. When collecting from any of these sources, immediately record any pertinent information about them. It is nearly impossible to keep track of this kind of data by memory alone. Each of these recommendations is the product of first-hand experience. Given the opportunity, these are the things that we would have done differently.

We hope that our work will provide an accessible and meaningful experience for patrons of the Higgins Armory Museum and a solid foundation for future teams to build upon.

Appendix A – Team Biographies

Eric Clayton

Eric, a member of the **Arms and Armor of the Medieval Knight** IQP, is a member of the class of 2009 at the Worcester Polytechnic Institute, studying Computer Science. He researched the weapons component of the project. His hobbies include Record Collecting, Origami, and Ghost Hunting. Contrary to popular belief, he does not have a glass eye.

Erik DeVolder

"Do you know how many documentary producers have been found dead in pools of blood?" –Art Bell

Justin Fyles

Justin Fyles left the wondrous land of Rye, New Hampshire to study Computer Science at Worcester Polytechnic Institute. He researched the social realm of the knight as part of the Arms and Armor of the Medieval Knight IQP. He also brought to the table a vast knowledge of audio production, and edited and produced the narration. Justin's hobbies include collecting obscure classic rock, skiing, and playing guitar.

Jonathan E.H. Hayden

Jonathan E. H. Hayden is an eager student of Electrical and Computer Engineering. His favorite pastimes include playing the electric guitar, riding ATVs, embedded development, and Linux computing. Jonathan specialized in the armor of the medieval knight and provided his voice for the narration of the video documentary. Technically speaking, Jonathan is not a leprechaun, but in fact a close relative.

Appendix B – Documentary Credits

A Film Produced by:

Eric Clayton

Erik DeVolder

James Justin Fyles

Jonathan E.H. Hayden

Faculty Advisor:

Prof. Jeffrey L. Forgeng,

WPI-Higgins Armory Museum

Narrated by:

Jonathan E.H. Hayden

Music:

James Justin Fyles

Eric Clayton

Jonathan E.H. Hayden

Filmed by:

Eric Clayton

Erik DeVolder

James Justin Fyles

Jonathan E.H. Hayden

William R. Short

Performers:

Mark Boyajian

Tannis Boyajian

Phillip Dickson

Renie Foote

Eli Huebner

Paul Kenworthy

Peter Kliem

J. Morgan Kuberry

Rachel Kuberry

Mark Millman

Frank Pendergast

Bob Reed

Jennifer Reed

Ryan Trunko

Andrew Volpe

Megan Wampler

Special Thanks to:

The Company of the Wolfe Argent

The Higgins Armory Sword Guild

Living Legends Farm

Prof. E. Malcolm Parkinson, WPI

Imran Malek,

Michael DeCuir,

and Curtis Jerry, WPI

Images Courtesy of:

The Higgins Armory Museum

The Morgan Library & Museum

Musée Condé

Bibliotheca Palatina of Heidelberg

Galleria degli Uffizi

Musee de l'Armee

Tschachtlanchronik

Creative Commons Music Courtesy of:

Dufay Collective

Tim Rayborn

Da Camera

Produced in Association with:

The Higgins Armory Museum

&

Worcester Polytechnic Institute

Appendix C – Documentary Script

NARRATOR The medieval knight conjures images of deadly weapons and shining armor. From the ancient tales of King Arthur to modern Hollywood movies, the knight's weapons and armor have defined his image. In fact, the historical knight was very much shaped by the arms and armor at his disposal, and understanding these artifacts is crucial to understanding the knight himself.	59 Words [Maybe rewrite this to focus more on the arms and armor aspect] [Show footage from public domain sources]
NARRATOR The fall of the Roman Empire signaled the end of a centralized military force in Western Europe. In the absence of well organized, professional soldiers, defense had to be organized locally. Simultaneously, changing	57 Words [Pictures depicting fall of Roman Empire/Barbarian invasion of Rome]

technology led to a transition from the infantry-based military system of the Romans to a new form of combat dominated by the mounted warrior.	
NARRATOR This change was made possible by the introduction of stirrups from Asia around 700 AD, which gave riders a much firmer seat in the saddle, allowing for the development of a new type of mounted warrior. By the turn of the millennium, the knight had come into being.	48 Words [Images of Peasants and Royalty. Also maybe clips of Aristocracy from Public Domain sources]
NARRATOR Mounted combat required a specialized horse, expensive arms and armor, and plenty of free time for practice. Feudal lords supplied their knights with valuable agricultural estates to support these expensive needs. With this wealth came a new social standing that brought the knight into the upper class. By the time of the First Crusade,	64 Words [Show various knight images/Footage of knight in armor]

around 1100 AD, the cult of chivalry was well established.	
NARRATOR A knight's training was designed to ensure that he possessed the military and social skills that were expected of him. By the age of eight, a boy would be sent from his home to serve in the household of a more powerful lord. There he would learn horsemanship, social skills and martial arts.	53 Words [Images of Page/Squire if possible] [Show Knight on Horseback, maybe from footage. Also show some image indicating social skills and use Talhoffer images (wrestling or swordplay) for martial arts.]
PROF. FORGENG *Interviewee talks about the time commitment necessary for the training of a knight. He parallels the knight's training to that of a modern athlete.	
NARRATOR In a battle, the mounted knight's primary weapon was the lance. By securing it under his arm, he could harness his horse's forward momentum,	35 Words [Footage of the jousting armor in the Armory could be used here. Also still images and maybe a short clip of impact from public domain source. Also very important to show

creating a powerful force focused at the tip of his lance.	the lance in the couched position here to explain meaning.]
NARRATOR To use the lance this way, the knight needed to be seated securely on the back of the horse. The saddle, spurs and stirrup provided the knight with the necessary stability.	31 Words [Show close-up stills of saddle, spurs and stirrup. Also maybe images of knight in saddle.]
NARRATOR The knight's saddle was steeply banked. The high pommel and cantle formed a deep cradle that allowed the knight to sit securely and withstand the shock of impact.	28 Words [Show pommel and cantle to help describe what they are. Show image of knight with lance at time of impact.]
NARRATOR The stirrups further stabilized the knight, allowing him to stand up and lean forward while riding, placing the full power of the horse behind his lance.	26 Words [Pan image of Knight riding while standing/leaning forward]

NARRATOR By the 1400s, the lance was more than 12 feet long. A conical plate protected the knight's hand, and the lance sat in a hooked lance rest attached to the knight's breastplate. The lance rest transmitted the impetus of the horse and knight through his armor into the weapon, allowing the maximum force to be delivered at the point of the lance.	62 words [Pan 14th c. lance image starting at tip.] [Still shots of vamplate and grapper]
NARRATOR The knights would charge into enemy lines with their lances to shatter the enemy formations. After the initial impact, the knights drew their swords to exploit the gaps they had created.	31 words [Show images or possibly Public Domain footage of Knight charging into enemy formations] *"Exploit" has the wrong emphasis here… re-record*
NARRATOR This kind of close-quarters combat called for the best available body armor. Mail shirts provided good protection	39 Words [Show close-up of mail links and pictures/video of a mail shirt]

against cutting attacks. This was the armor at the time of the crusades, and it was still common well into the 1300s.	
NARRATOR Yet mail did not fare well against piercing weapons, such as arrows, or blunt, heavy weapons.	16 Words [Show piercing weakness of mail armor against dagger]
NARRATOR By the 1200s, armorers were adding small iron plates to provide extra protection in vulnerable areas. By the 1300s, these plates grew in size and began to be jointed to each other. By 1400, the well-equipped knight was protected from head to toe with an articulated suit of steel.	49 Words [Show images/footage of armorer at forge] [Show pictures of half-plate or early plate] [Show panning footage of Knight in full plate]
NARRATOR During the 1400s, armorers nearly perfected the art and science of armor-making. Strategically located angles and	87 Words This date needs to be replaced with a historical event. Most of the dates mentioned in this script will be in the 1400s. [Show a particularly nice suit of 1400s armor,

curves deflected lances, arrows, and cutting attacks. The plates were designed to flex with almost perfect mobility, while minimizing exposed areas. The steel itself was carefully heat-treated to maximize its strength and toughness. From start to finish, it might take an armorer and his assistants about 3 or 4 months to forge a full suit of armor. The finished product might cost as much as a craftsman made in a year.	preferably Italian] [Show a sword glancing off the surface of a nice suit of armor]
NARRATOR A common test of plate armor's quality was to shoot a crossbow at the suit. The dent left behind was known as a proof-mark; the mark proved that the armor could stop projectiles.	33 Words [Zoom into a proof, use the previous suit if possible] [Pan across a large group of knights in battle]
NARRATOR Donning a suit of armor was a complex process. First, the knight would be dressed in a padded jacket to which the armor was fastened. Elements of mail	102 Words [Show footage of arming doublet and fastening of armor.]

armor were tied in place to cover gaps in the plates, such as the armpit, elbows, and groin. Finally the plates themselves were tied in place. The knight was suited from the feet up with the help of a squire. The whole process took under fifteen minutes. The helmet and gauntlets were put on last of all. Fully armored and mounted on his warhorse, the knight was the medieval equivalent of the modern tank.	[Show more footage of arming process] [Show footage of helmet going on]

NARRATOR While plate armor offered outstanding protection, it did have limitations. A typical suit of armor might weight sixty to seventy pounds. If a knight was not in peak physical condition, he could quickly become exhausted. Also, during battle, a knight could become dehydrated or overheated in the heavily insulated suit. With the visor down, his field of vision was limited. There were also gaps between some of the plates. Some of these areas had secondary protection of mail, but others, like the eyeslits, were very vulnerable to thrusting attacks.	89 Words [Show footage of knight keeping hydrated] [Show shots/still of helms with large visors. Maybe public domain shot of jousting from inside helmet.] [Show Talhoffer images of dagger against armored Knight.]
NARRATOR Weapons evolved to exploit the weaknesses of armor.	8 Words [Show Talhoffer images of armored Knights fighting half-sword]
NARRATOR Swords were transformed from chopping weapons to styles optimized for thrusting at gaps in armor.	15 Words [Pan images of early swords maybe interspersed with old manuscript images of swords in use]

NARRATOR The typical knightly sword of the 1400s was the longsword or hand-and-a-half sword, so called because it was designed to allow either one- or two-handed use. A highly tapered, agile weapon, the longsword weighed around 3 pounds, with a blade that measured close to 3 feet.	46 Words [Footage of armored knights wielding longswords, or unarmored knight examining sword]
NARRATOR On horseback, the longsword was used one-handed. On foot, both hands were used. The sword's length allowed it to be used like a short spear: placing his secondary hand on the blade, a knight could maneuver a longsword into weak spots in an opponent's armor. The longsword might even be turned around in the hands to be used like a blunt instrument, dealing stunning and crushing blows.	67 Words [Show footage of armored knights fighting half-sword or talhoffer images of this]

NARRATOR Even more powerful attacks could be delivered with specialized war-hammers, which might be one-handed for use on horseback, or longer two-handed versions for use on foot.	26 Words [Show images of longer, more tapered weapons and quick shots of bec-de-corbin]
NARRATOR These weapons consisted of a metal head with a hammer or axe on one side and a sharp beak on the other, mounted on a wooden shaft.	27 Words [Pan over shorter warhammer image] [Focus image on Hammer head here]
Interviewee *Talks about the large concussive force delivered to an armored opponent, and the use of the fluke on the back of the weapon.	
NARRATOR While all of the weapons in a knight's arsenal were deadly, finishing off an armored opponent usually required the	27 Words [Show images of knights in close quarters]

knight to engage his opponent in close quarters.	
NARRATOR Because of this, a knight's martial training not only covered armed combat, but also grappling and wrestling techniques. The knight learned how to throw his opponent, and once he was down, to pin him to the ground.	37 Words [Cut to many images of grappling from fechtbuchs] [Throwing/pinning images here]
NARRATOR The finishing blow would be delivered with a dagger at a weak point in the combatant's plate armor.	18 words [Show Talhoffer images of coup-de-grace or video footage from old group.]
NARRATOR A knight's dagger would have a strong thrusting blade, and sometimes no edge at all, allowing it to force its way through the links of protective mail at the opponent's armpits.	31 Words [Show dagger worn as sidearm on knight.]

NARRATOR By the time plate armor came into being in the 1300s, the supremacy of the knight was already being challenged by improved infantry tactics and training. Well-disciplined footsoldiers with long spears or halberds, like the Scots at Bannockburn in 1314 or the Swiss at Morgarten in 1315, were able to defeat mounted knights. Porcupine formations of pikes could stop the impetus of the charging horses, leaving the knights vulnerable to a counterattack.	72 Words [Show images of longbows, crossbows and maybe arquebus]
NARRATOR Such tactics were even more effective when combined with powerful missile weapons. The English longbow, capable of raining down arrows at rates over 10 shots a minute, delivered crushing defeats to French knights at Crécy in 1346 and Agincourt in 1415. Crossbows had a slower rate of fire, at	69 Words [Pan still image of longbow] [Use footage of archer] [Show close-ups of arrow and arrow heads if possible.]

only 2 to 3 shots a minute, but they could be tremendously powerful, able to pierce even the strongest armor.	
NARRATOR But the weapon that ultimately spelled doom for the armored knight was the firearm.	14 Words [Pan image of firearm being used in battle]
NARRATOR By the 1400s, firearms had started to become a familiar sight on the battlefield. Initially clumsy and hard to aim, by the early 1500s they had developed semi-mechanized firing systems that made them increasingly accurate. Italian firearms dealt armored French cavalry a crushing defeat at the battle of Pavia in 1525, heralding an end to the age of the armored knight. Over the 1500s and 1600s, firearms outstripped the protective ability of plate armor, and by 1700 armor had been almost entirely abandoned.	83 Words [Pan another image including many firearms] [Use footage of firearm loading and other firearm pictures here, especially against an armored opponent]

NARRATOR Battle now belonged to the side who could bring the best firepower to bear.	14 Words
NARRATOR As changing technology gave rise to the knight in the early Middle Ages, so new technologies eclipsed the knight as the Middle Ages came to a close. For centuries in between, knightly supremacy was the decisive factor on the battlefield. The knight's state-of-the-art arms and armor, combined with his lifelong training, made him the dominant figure in warfare, and helped shape the mystique of chivalry that was a defining feature of medieval society. Even today, when all we have left of the knights is their suits of steel, their legacy retains a powerful hold on our imagination.	97 Words

Word Total: 1560

Running Time:

Appendix D – Original Project Proposal

Introduction

This group will research the arms and armor of the medieval knight, working to develop a short video-documentary, to be shown at Higgins Armory Museum, which focuses on the weapons, armor, warhorses and the historical context of the knight. The team will also prepare a research document that will represent the information collected.

The video-documentary will highlight and unite the historical context, armor, arms and equestrianism of the medieval knight into a palatable form.

One topic will focus on the history and context of the Middle Ages. This rather broad subject will be divided into four major divisions. The first will focus on the history of the Middle Ages, including the context and happenings in the world during this time period that influenced the goings on in medieval England. Another focus point will be on the history of knights, touching on their social and economic status, and their role in society through the years. Culture of England during the Middle Ages, including chivalry, heraldry, and tournaments, will be described in detail as well. A more specific description of the Knight, including his upbringing and training, will conclude this section.

The medieval knight had many weapons at his disposal, including swords and staff weapons, as well as daggers and wrestling take-downs for close range combat. While the sword is commonly thought of as the knight's primary weapon, it was difficult to use effectively against plate armor. Blunt staff weapons and pole arms, such as the Bec de Corbin were much more effective against a knight's armor. As the armor and technology of the Middle Ages progressed, weapons adapted to these changes. By the end of the Middle Ages, new weapons such as the firearm had obviated the knight.

The armor of the Middle Ages underwent major changes that culminated around 1400C.E. Therefore, this group will address armor before and after this crossroads separately. This group will explore armor through the eyes of the medieval knight and perform in-depth analysis on traditional manufacturing techniques.

The horse played an important role in the Middle Ages. From the draft horse to the warhorse, the horse has appeared in many forms, and served many purposes. This project will investigate the horse's equipment, training, breeding and physiology, especially focusing on how these topics affected the medieval knight. The Lance will be covered in depth, as it is the primary weapon of a mounted knight. Barding will also be researched, as a horse's protection becomes more important as the middle ages passed.

Topics and Subtopics

History/Context:

1. History of the area/Geography/Context of middle ages – social structure, feudalism
2. History of Knights (broad scale)
3. Cultural world/Tournaments/Chivalry/Heraldry
4. Upbringing and training of the Knight (individual scale)

Medieval Arms:

1. Daggers and Wrestling
2. Swords
3. Blunt Weapons/Pole arms
4. Bow/Gunpowder Weapons

Horses:

1. Horses – Breeding, Breeds etc.
2. Horse Equipment (stirrups, spurs)/Barding
3. Horse Training/Equestrianism
4. Lances

Armor:

1. Pre-1400 Armor
2. Post-1400 Armor
3. Wearing Armor
4. Manufacturing

Plan of Work

B Term

Week 1

Group:

- *Read resources and begin note outline.*
- *Request Source materials through Inter-Library loan.*
- *Outline of video contents*
- *Watch a documentary*
- *Assemble individual subtopic lists for week 2-5*

Week 2

Group:

- *Talk to film/editing consultant*

History:

- Research History of the area/Geography/Context of middle ages

Arms:

- Research Daggers and Wrestling

Armor:

- Research Pre-1400 Armor

Horses:

- Research Horses – Breeding, Breeds etc.

Week 3

Group:

- *Update Filming/Editing SOP*

History:

- Research History of Knights (broad scale)

Arms:

- Research Swords

Armor:

- Research Post -1400 Armor

Horses:

- Research Horses Equipment/Barding

Week 4

Group:

- *Watch a documentary*

History:

- Research Cultural World/ Tournaments/ Chivalry/ Heraldry

Arms:

- Research Blunt Weapons/Polearms

Armor:

- Research Wearing Armor – fighting in armor, etc.

Horses:

- Research Horse Training/Equestrianism

Week 5

Group:

- *Film a talking head*

History:

- Research the upbringing and training of the knight

Arms:

- Research Bow/Gunpowder Weapons

Armor:

- Research Armor Manufacturing

Horses:

- Research Lances

Week 6

Group:

- *Prepare full draft for individual Research*
- *Prepare revised video outline*
- *Provide video sample*
- *Task list for C Term*
- *Schedule filming*

Week 7

Group:

- *Update Proposal*
- *Draft video script*
- *Update video SOP*
- *Hands-on armor session*

C Term

Week 1

Group:

- *Revise script*
- *Film*
- *Determine 2 narrators*

Week 2

Group:

- *Revise script*
- *Edit existing film*
- *Film*
- *Gather stills*
- *ID music and permission process*

Week 3

Group:

- *Finalize script*
- *Edit film*
- *Film*
- *Photo objects*

Week 4

Group:

- *Record Narrators*
- *Design intro image and credits/other graphics*
- *Edit film*

Week 5

Group:

- *Edit film*
- *Compile credits list*

Week 6

Group:

- *Continue editing video*
- *Task list for D Term*

Week 7

Group:

- *Finish editing film – Full draft in place*
- *Revised plan of work*
- *Make sure research document is all pulled together and revised*
- *Take film to Ed. Dept. for review*

D Term

Week 1

Group:

- *Brainstorm introduction*

Week 2

Group:

- *Write introduction*
- *Brainstorm conclusion*
- *Write appendices*

Week 3

Group:

- *Write Conclusion*
- *Team bios/photos*

Week 4

Group:

- *Prepare Final Report for Submission*
- *Abstract and Acknowledgements*

Week 5

Group:

- *Complete Electronic Version of Project*

Week 6

Group:

- *Submit project on disks*

Week 7

Group:

- *Finalize and turn in everything*

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