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Martial Arts of the Middle Age

Interactive Qualifying Project Report

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by

Andrew Aveyard _____

Jason Cardwell _____

Brad Davison _____

Daniel Haggerty _____

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Professor Jeffrey L. Forgeng, Advisor

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Abstract

This project researched and developed an instructional DVD on the martial arts of medieval and Renaissance Europe. The DVD was created to accompany the Higgins Armory collection in its new home at the Worcester Art Museum and will assist future instructors and students in the Higgins Swordplay program. The DVD provides a general introduction to the history and principles of combat, as well as an introduction to cut-and-thrust swords, rapiers, daggers and wrestling, and staff weapons.

Introduction

This project created a DVD supplement for European medieval martial arts study. Our DVD covers introductions into a variety of practices from the 14th century onwards, following in the footsteps of the medieval fencing masters. The intent of this DVD is to be used as an auxiliary resource for both students and instructors in their studies of the martial practices. It details the origin of the practices, fundamental principles for combat, and introductory knowledge on several weapons and their techniques, including cut and thrust swords, rapiers, daggers and wrestling, and staff weapons.

These practices declined after the medieval age with the rise and spread of gunpowder weapons. The martial practices continued to dwindle until the late 20th century when a sort of resurrection occurred. The re-discovery of the ancient manuscripts, documents created by fencing masters to spread their vast knowledge, sparked renewed interest in the subject. This interest exploded

to become a hobby for many enthusiasts, in addition to drawing attention in academia from numerous scholars and historians.

The Higgins Armory Museum was a trailblazer in this new field of medieval martial arts study. Originally founded in 1931 as a museum of steel craft, including knightly armor, the museum eventually rebranded itself and became the only museum in the western hemisphere dedicated to arms and armor. The Higgins Sword Guild was created in 1999 as a group dedicated to studying the practices of the masters of old. Although a few similar groups had begun to surface around this time, the Sword Guild had the unique advantage of being hosted within one of the most relevant museums in the world. The guild was founded by two of the leading scholars of the field, Jeffrey Forgeng and Patri Pugliese, had hands on experience and interaction with the weapons themselves, and even had original copies of the ancient treatises.

The Higgins Sword Guild provided groundbreaking research in the field for over a decade until the museum's closing in 2013. Although the guild's time has ended, this DVD and other related projects are intended to continue its legacy. This DVD will follow the Higgins collection to its new home at the Worcester Art Museum, to assist future instructors and students in carrying on the work started by the Higgins Sword Guild. It contains introductory information on the concepts of European medieval arts, beginning with an introduction to the field, followed by the basic principles of melee combat.

Understanding the foundations is the core to understanding combat, especially in close-quarters, where one misstep results in game over. The acronym BLOOD is used to refer to some of the most important principles, balance, line, eye contact, and distance. These concepts summarize four core principles that any fighter needs to know to be successful. Another vital aspect of combat is the physics behind the fight. The leverage, speed, and energy of a weapon or limb all heavily affect the way it is used and the outcome of a strike. Any fighter who can truly understand the physics behind every movement will be much better equipped to handle serious combat.

As a well-known medieval martial art, swordplay is a major point of study in our project. Drawing on a wide breadth of treatises and documents by both masters and historians, our DVD covers the fundamentals of combat with cut and thrust swords and rapiers. Cut and thrust swords are the iconic swords of the medieval age, simple but versatile and deadly. Rapiers are Renaissance swords that closely resemble the modern fencing blades. Thin and long, rapiers focus on delivering quick and precise thrusts. Many concepts are presented for both styles of sword, ranging from different guards and techniques to footwork and training drills. The video provides an effective training resource for learning the art of fighting with a bladed weapon.

Although swordplay is the most influential and garners the most interest, it was not as important to a knight as the study of daggers and wrestling. Nearly all close range combat breaks down to hand to hand fighting and a warrior who was unskilled in this style of fighting would surely be killed. The DVD covers an introduction to the essential techniques a fighter would need to know such as blocks, holds, and throws.

Staff weapons were also a lesser known tool of the combatant but they are just as interesting. The techniques for using a staff weapon draw heavily from the techniques of a longsword. As such there is not a large amount of extra explanation needed but we explain how some of the basic moves can be translated to staff weapons and show some interesting sequences, showcasing the use of these techniques in combat.

This project will discuss each weapon and technique on an introductory level to give newer students and instructors alike the basics of medieval martial arts. As an axillary in resource, this project

will not only provide information to potential combatants, but show the truth about the martial techniques and how they were taught.

History of European Martial Arts

By: Jason Cardwell

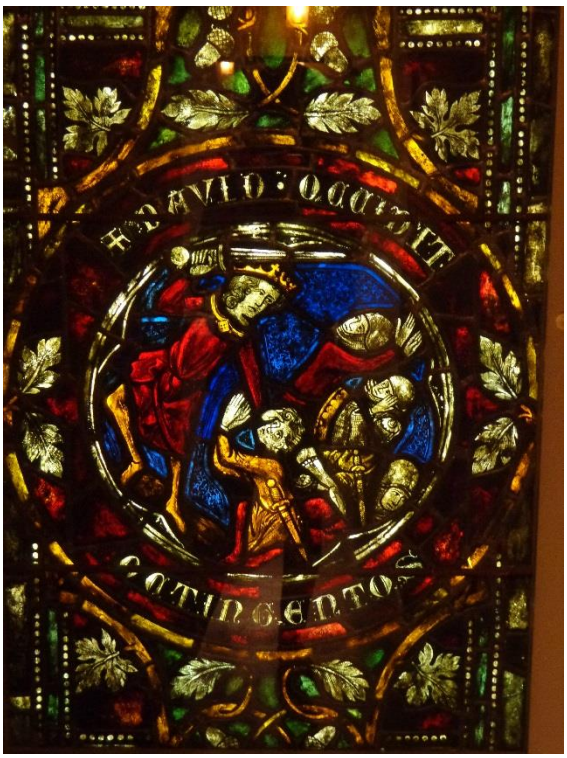
Medieval Time Period

The Dark Ages, the period generally defined between the 6th and 13th century are aptly named, a period of darkness, barbaric violence, and conflict. Perhaps, though, the darkest part of the Dark Ages was the loss, or possibly the lack of collection, of knowledge. Historical knowledge of the Dark Ages is hard to come by in the present day, which leads to many relying on interpretation of what the time period might have been like. Despite the widespread mortal struggles, not even information regarding combat was kept or recorded. If they were, records of war education are so rare that they nearly reach the realm of non-existence. It is for this reason that the history of martial arts in Europe cannot accurately begin until the late medieval age. In fact, the earliest known European manuscript on martial arts dates back only to the 14th century, the I.33 manuscript written around 1325. This treatise of combat may not have been the first of its kind, but it is one of the earliest known examples that has been located.

Environment of the Medieval Age

Before one can understand the manuscripts themselves, one must understand the time period they were created in. The Medieval Age began somewhere in the Dark Ages, as eras in time often overlap. The Early and High Middle ages experienced much of the same characteristics of the Dark Ages, the poor education and lack of recorded history. It wasn't until the Late Middle Ages, from about 1300-1500 that this changed and the first combat treatises began to appear. During this time, Europe was still under the grip of feudalism, with people from peasants to barons all living in a state of allegiance to someone above them. Feudalism itself was created during turmoil of the Dark Ages, as a man was not safe on his

own in the world, not with barbarians roaming the lands. To the north, Norse and other pagan raiders would pillage and destroy, and to the east new hordes of attackers came all the time. It was for this reason that the social contract between the peasant and the lord was formed. The lord offered protection and safety at the cost of freedom and labor. If the average peasant wanted to survive, he had to live under a liege. Unfortunately for this average peasant, the protection that was promised by the lords didn't always encompass him. Even worse, the lords only had two forms of protection: castles and armies. In the former, if the peasant was lucky enough to make it into the castle before it was locked down, he might still die while defending the fortification, which is something that would be expected of him. In the latter, the armies themselves would often be compromised of the peasants they were intended to protect. It seemed that the peasants got the short end of the deal, most likely from their lack of any real education or true military power. However, the army was not completely made up of peasants. There was always a percentage of professional troops, knights, and men-at-arms. The best of the lords could afford to have larger and larger numbers of these professional soldiers. During the Late Middle Ages, the invention of artillery particularly accelerated the need for professional warriors. Castles had always been the main stay of medieval warfare, with most wars being fought through a series of prolonged sieges. These new artillery weapons, however, decimated castle walls with relative ease, therefore increasing the necessity of open field fighting and, by extension, the need for trained and disciplined combatants. (Rogers 2007, *Soldier's Lives*).



A glass image from the Middle Ages depicting the oppressive rule of lords.

Knightly Combat

Images of knights charging heroically on grassy plains are generally what is conjured in the mind when the phrase “medieval professional soldier” is mentioned. Despite this connotation, knights and medieval warfare are generally viewed as barbaric. Yes, it was assumed that knights received some kind of training before they made their oaths to their people, their lords, and their God, but this training is rarely looked at in modern media, with more focus being shown on “knightly gallantry.” It is generally assumed that if the knight wasn’t romantically rescuing a princess in a tower, he was either slaughtering peasant-soldiers of a rival lord or jousting for honor in a tournament. In particular, despite being viewed as protectors of honor and justice, they were assumed to be nothing more than brutes encased in steel when it came to combat. They either trampled their enemies on horseback, or cumbersomely bumbled around the battlefield destroying unarmored opponents with ease and whacking at fellow knights until one of them fell over. Nothing could be further from the truth. The armor of a knight was barely, if at all, encumbering during combat, and they most certainly were not brutes. They were educated and capable warriors who trained their entire lives for combat. Part of the frustration for those who study the Dark Ages is the lack of any knowledge regarding the training of soldiers during these times. At one time, the medieval ages were thought to be similar, but the discovery of the martial arts treatises of the late Middle Ages proved otherwise.

Perhaps the most common form of training that we imagine a knight receiving would be that of mounted combat. As depicted in many surviving images, jousting was one of the mainstays of the medieval era and one of the first thing people think about today. Jousting itself reflects its wartime application of cavalry charges, which was possibly the most devastating tactic in medieval warfare. Only a tight and disciplined formation of soldiers armed with pikes could possibly stop a heavy cavalry charge. Since most of the fighting men in medieval armies were untrained and ill-equipped peasants conscripted

to fight, battles heavily relied on the use of knights to crush larger forces of foot soldiers. But as we now know, knights were very capable of fighting in unmounted combat. They were not nearly as encumbered by their armor as generally thought and could perform very well without their horse. Knights would be extensively trained with a wide variety of weapons and techniques, including swords, daggers, lances, staff weapons, and even wrestling, a fighting style that is not often considered in a knight's repertoire. Wrestling was actually one of the most important techniques a knight could learn, because in the heat of battle it's hard to maintain the proper distances necessary for using certain weapons correctly. In fact, once combat between two opponents passed a certain threshold of short range, wrestling was almost inevitable. All of these techniques were important to the knight, and every knight would be required to understand them. Knights were not brutish warriors surrounded by steel, but highly trained and disciplined students of war. And like any good students, they required teachers.

A painting depicting a typical knight on horseback with a lance. Note the lavish decorations both on armor and on the mount itself.

Masters and their Manuscripts

Although masters of combat most certainly existed before this time, it wasn't until the late Middle Ages that the transcription of techniques in treatises and manuscripts would document just how knowledgeable the masters could be. Medieval combat manuscripts are

An image from the I.33 Manuscript. The art style of the time period showed itself in the manuscripts.

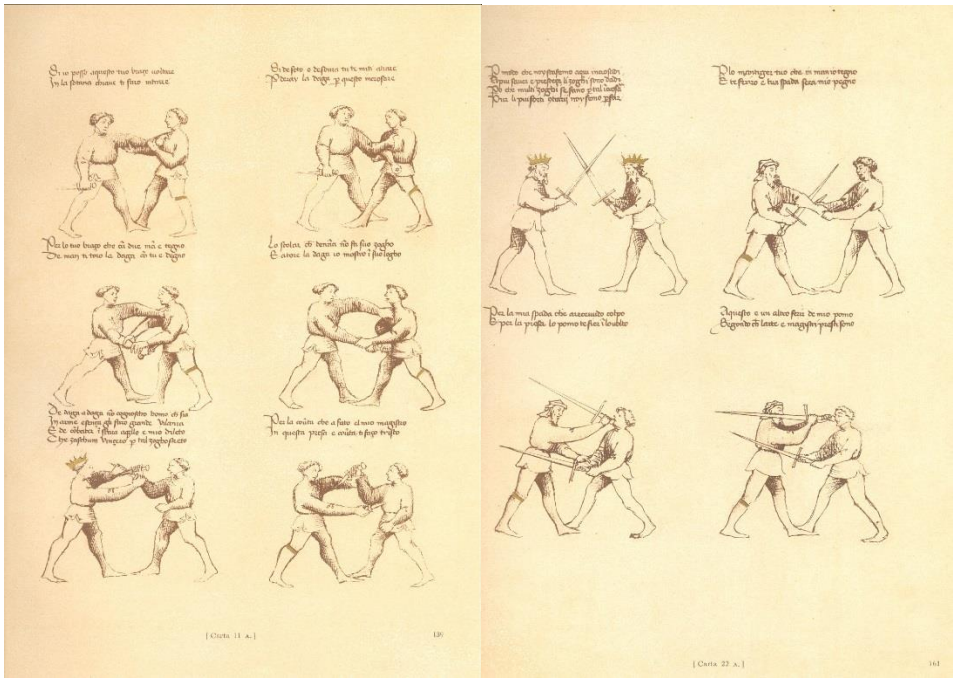
extensive, detailing combat in all its forms at the time, and provided complete knowledge of how a knight should carry himself through life. These descriptions ranged from combat itself to sleeping and eating habits to mundane accounts of daily life practices. The images throughout these treatises similarly followed the art styles of the period, becoming beautiful renditions of the procedures of particular fighting styles.Some manuscripts had no text at all, and were solely filled with spectacular drawings that would be interpreted and their techniques executed. The manuscripts blur the line between training textbook and artistic masterpiece.

Like any great teaching tool, the manuscripts and treatises were developed by extremely competent masters of the trade, in this case, masters of combat. Hans Talhoffer, a 15th century German, is one such master. His first fencing manual, a personal reference book called MS Chart A.558, was created in 1443. Although many early treatises illustrated their teachings with pictures, Talhoffer's do so with almost no text whatsoever. This left both the student and the present day scholar with a bit of self-interpretation, as not everything can be translated by pictures. His first personal reference book in particular had no text at all outside of the wrestling section, and even that section had very simple one sentence instructions. This gives historians a clear indication on the importance of visuals when creating these fighting manuals, as only so much could be gleaned from writing when compared to seeing the real thing.

One of the illustrations from Talhoffer's section on Longswords. This picture exemplified the need for interpretation due to scarcity of text.

Talhoffer's complete work showed his breadth of fighting techniques, with sections that include fencing, armor and unarmored dueling, grappling, flail fighting, mounted fencing and archery, even dueling between a man and a woman or peasant dueling. His work was comprehensive, detailing how to effectively use all common weaponry of the age, and in specific situations that would require different methods outside of the norm. (http://wiktenauer.com/wiki/Talhoffer)

Before even Hans Talhoffer, masters of warfare had started to compose their knowledge into these complete treatises. One such treatise is Italian fencing master Fiore dei Liberi's *The Flower of Battle (Fior di battaglia)*, created in 1410. One of the few surviving treatises from the schools in Italy, Fiore's work showcases his impressive knowledge of combat that was on par with Talhoffer's complete work. Unlike Talhoffer's treatises, *The Flower of Battle* boasted larger textual explanations next to each depiction of combat. However, just like the German master's work, Fiore's combat manuals had vivid and intricately drawn works of art to display his impressive range of teachings.



Some images of Fiore's manuscript style. The left page details dagger and grappling combat, while the right depicts typical longsword combat.

While it may have not contained some of the more outlandish sections on peasant dueling, *The Flower of Battle* was broad and deep. It contained sections on all of the current era weapons, as we have come to expect from the masters of this caliber, as well as sections on self-defense and even dirty tricks and improvised weapons. (Ken Mondschein, *The Knightly Art Combat)*

Renaissance Time Period

History has no definitive borders marking one period from the last. The line between the medieval period and the beginning of the Renaissance cannot be narrowed down to a single point in time. The Renaissance was a period of deep changes to tradition, scientific advancement, and artistic exploration, roughly spanning from the 15th to the 17th century. All men, be they kings or peasants, soldiers or poets, experienced the winds of change over the period of the Renaissance. Martial arts practices were no

exception to this change. To understand what exactly these changes were and how they occurred in the first place, we must first understand the broader forces at work.

One of the first and largest catalysts of change in the Renaissance was the political shift and decline of feudalism. For centuries Europe had been fragmented by the noble class each laying stake to feudal territories, with the lower classes all falling under the authority of their separate lieges. A man was loyal to his local lord, who in turn was either independent or loyal to another lord above him, but at every level the local man was still only loyal to the man right above him. This largely left the monarchies weaker than the accumulative power of the nobles below them. However, during the late Middle Ages and Renaissance, kingdoms grew more powerful and the independence of the smaller lords receded. Nations began to coalesce, and countries like France and England became much stronger than their still feudal counterparts in other parts of Europe.

This new political landscape lent itself to another important concept that began to surface during the late Middle Ages, standing armies. More and more, nations began to organize troops into a single army loyal to the king directly. This new organization led to many military improvements, namely better management and response to threats, but more importantly, it took power away from the nobility and placed it in the hands of the kings. In the Medieval Era, a single traitorous or cowardly noble could spell disaster as his troops switched sides or fled the field of battle, as the majority of a king's army were loyal to smaller feudal lords. Now the majority of the army was loyal directly to the king, giving him greater leverage against his nobles. These standing armies required not only different organization, but simple and standardized methods of training for the troops. This might have been beneficial to the masters and their study of swordplay had it not been for the silver bullet of all traditional martial arts of the time: the invention of the gun.

Broken Swords: The Rise of Guns

> *"Gracious prince and lord: the knightly and noble art of combat at this time has gone somewhat in decline with many people, and this is without doubt the greatest and chiefest cause of all, namely that in recent times the ignoble gun has arisen and so taken the upper hand, that by its agency the most manly and skilled hero can be suddenly deprived and robbed of his life sometimes even by the pettiest and most timid men; and often friend as well as foe is hurt and harmed by it." –Joachim Meyer, The Art of Combat (pg. 37)*

In his dedicatory preface to Johann Casimir, Duke of Bavaria, the German fencing master Joachim Meyer describes his frustration and despair of the decline of the "knightly and noble" combat arts in his 1570 manual *The Art of Combat*. While it is perhaps obvious to students of history in the present day that the advent of firearm technology would destroy any study of combat in the traditional medieval sense, the contemporary masters of the era did not so readily accept this change. They fought tooth and nail to continue their traditions of martial combat and knightly attitude. In fact, some masters like Meyer went so far as to blame the vices of the world on the disturbing decline of noble and knightly practices. "For once the Romans thought they conquered the entire world, as an overconfident nation they devoted themselves to sensualities more than to good arts, policy, and knightly practices, and through this their entire empire was undermined" (Meyer, pg. 38). Meyer would go on to recount the histories of the time, naming German hero after hero who had all studied the knightly practices and been better for it. However, since firearms had just recently been invented and were still being developed, it is was impossible for Meyer to know what the future heroes who had access to this technology would be like. Despite Meyer's and other masters' protests, firearms were here to stay. As discussed in the previous section, the growth of national powers demanded central standing armies loyal to the nation itself.

The gun would prove to be a much easier weapon to train the common man to use.

A knight's training was measured in years, starting from a young age through adulthood. It was no small task to create a good knight. As scientific advancements continued, time became synonymous with money, and kings looked for quicker ways to raise troops. Part of the purpose of a standing army was to be standardized and readily available for times of conflict, and for this, the gun fit perfectly. Not only could you train simple peasants to use a gun at any time, allowing for quickly assembled militias, but learning the proper ins and outs of a gun took a matter of weeks, not years. In the medieval era, untrained peasants formed the bulk of armies but were easily crushed by better trained and equipped soldiers. Now, the equipment and training became balanced, as a volley line could be performed just as accurately and easily with a group of uneducated peasants as it would be performed by a group of highly trained warriors.

Another effect of the discovery of gunpowder that would lead to the downfall of conventional swordplay is artillery. In the Middle Ages castles were king, the benefits they provided greatly influenced the outcome of wars, and the defenders always had upper hand. In fact, most wars during the time period centered on sieges, with armies gaining territory slowly and fortifying it. With the dawn of

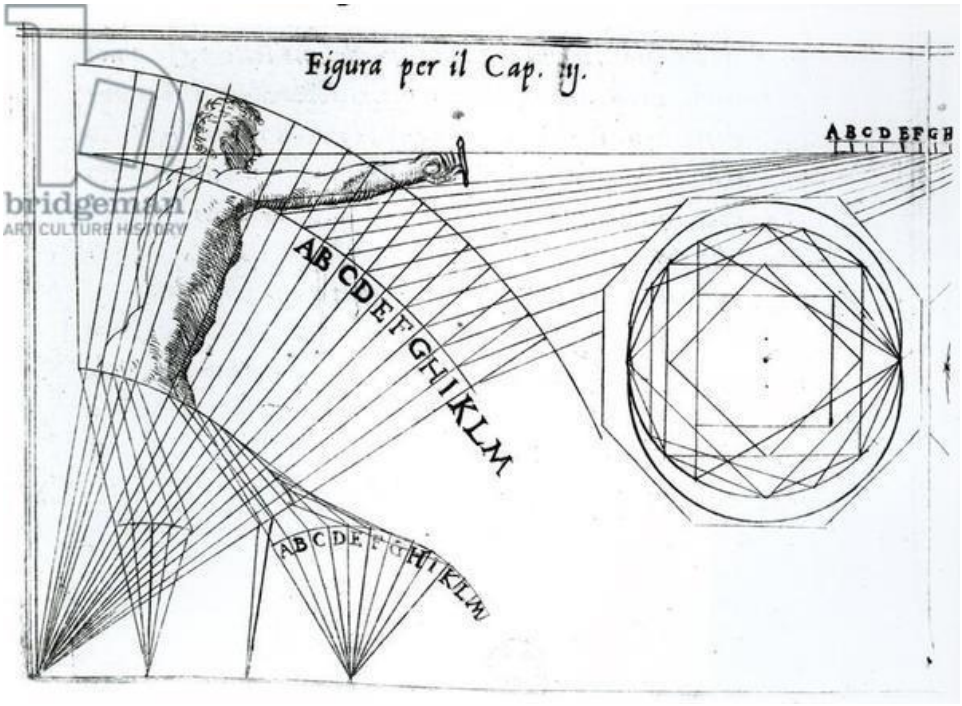
artillery, the power of castles fell sharply. Now a siege could be accelerated with the destruction of fortifications, and the benefits of having castles declined rapidly. This change would lead to larger ratios of open field battles. In these battles, ranged projectiles had always held some advantages over different tactics, but now with guns, their advantage became overwhelming. Those simple-to-perform volley lines would soon become the mainstay of military tactics, and with their rise, the fighting styles of yesteryear would fall.

Masters and their Manuscripts: Continuing the Tradition

Although the advantages of guns could not be overstated in terms of warfare, masters of fence and other combat styles would continue to develop and teach their practices well into the Renaissance. As we have already heard, Joachim Meyer would not only continue his practice of the traditional martial arts, but would argue against the spread of what he considered to be ignoble and profane practices, detrimental to the very souls of the German people. But what of other masters before him? By the late 16th century, guns had clearly and definitively made their mark on warfare in Europe, but they had first been introduced as early as late 13th century. The oldest written recipes for gunpowder in Europe date between 1280 and 1300 (Kelly 2004, *Gunpowder*). As we know from earlier discussion, the oldest known combat manual is the I. 33 manuscript, dating to around 1325. Therefore, despite the master's tendency to dismiss and dislike the use of gunpowder, the time period which they began to create their own manuscripts and treatises would correlate to the rise and eventual dominance of gunpowder in Europe.

Despite the major impact that gunpowder had on martial arts masters, their work continued well into the Renaissance, and with this new period, they began to adjust their work for the changing times. Camillo Agrippa was a 16th century Italian master of fence, and one of the first masters to adjust his teachings to the coming age. Living in 16th century Rome, Agrippa had a front row seat to the changing

world, and these changes influenced his teaching of fencing. Agrippa began including modern ideas on the particulars of the body, combat itself, and its place in society. Agrippa would go onto title his 1553 treatise *Trittato di Scientia d'Arme*, or *Treatise on the Science of Arms*.



An image from Agrippa's work, exemplifying his scientific approach to the teachings.

Agrippa quickly found his place in the new scientific methods of the period, and applied them to his teachings of fencing. Agrippa used these new found principles of science and mathematical study to enhance his teachings. His teachings would eventually become standard principles that later treatises would follow. (Mondschien 2009, *Fencing*).

A little after the Italian fencer began his scientific study, another master of combat would take a different approach to the changing world. The author of the earlier plea to the Duke of Bavaria against the profanities that guns had let loose on the world would continue his study in the traditional methods of the medieval era. As we know, Joachim Meyer of Strassburg, Germany had particular disdain for what he saw as the fall of knightly and noble practices in the world due to the advent of guns. He states

himself that "… I have no doubt that if this [knightly] art had been written and published before our time in comprehensible good order, then not only would the noble art not have so declined with many people, but also abuses would have entirely been avoided" (Meyer/Forgeng 2009, *Art of Combat*, pg.41). Meyer believed that the traditional knightly practices were influential in keeping the world a better place. He saw the gun and its alteration of the world as nothing more than a decline in society. Meyer believed that despite the ramifications of the gun, soldiers would still need to know the traditional martial arts of the medieval era while in combat.

Meyer used extensive drawings to showcase his teachings, using the same image for many movements. Despite his preference for tradition, scientific influences still show in his work.

As such, he taught in the traditional methods that we saw in the Middle Ages, teaching the student in a way that reflected his knightly and noble ideals. Contrary to Agrippa's scientific and proto-Enlightenment modes of teachings, Meyer taught his students with a traditional understanding, often citing honor and using terms such as manly. It was his intention to continue these customary instructions to stem the tide of more ignoble practices. (Meyer/Forgeng 2009, *The Art of Combat*)

Post-Renaissance Time Period

Similar to the end of the Medieval Age, the Renaissance saw no clearly defined border between it and the Age of Enlightenment that was to follow. In fact, the enlightenment era could have only been produced out of the Renaissance, as it continued the political, philosophical, and scientific advancements that had first begun during the earlier age. For all intents and purposes, the Age of Enlightenment can be said to begin sometime around the early 1700s.

By this time, national powers had become the mainstay of the political landscape in Europe, and the feudalism that had slowly been declining during the Renaissance was almost entirely eradicated. The advancement of numerous sciences led the way to a more educated citizenry, mostly through innovations such as the printing press. These societal changes entered unchartered territories, and new ideals that had recently surfaced in the end of the Renaissance paved the way to an even more sophisticated society. The developments in political thought, namely the idea of nationalism, would eventually give rise to events such as the French Revolution, with the view of the divine right of kings suddenly under threat. The expansive Age of Exploration that had occurred during the Renaissance age would also lead to Europe becoming a defining political, economic, and military power to the rest of the world. As imperialism went full swing, trade and maritime interests grew as international economies began to form. With this new rise of imperialism, the earlier transition to national armies that had occurred during the Renaissance would now be complete. While some mercenary bands could be privately hired, the vast majority of all military power rested in the hands of the leaders of these imperialistic nations.

The End of Traditional Martial Arts in the Military

The national armies that began developing during the Renaissance required standardized training for war, and the traditional medieval martial art practices began to fall aside. Much to dismay of the old masters such as Meyer, guns continued their revolution of warfare until they were the sole method. By the 1700s Europe saw no more warriors in armor wielding impressive varieties of melee weapons, replaced by the contemporary soldier in military dress with a gun. The only military applications of a traditional sword was that of the cavalry. Like the knights of old, who were invaluable when dealing with the lesser-equipped and poorly trained medieval infantry, the 18th century cavalry still provided a much needed component to any army. Unlike their knight cousins of the medieval era, contemporary cavalry would not be able to charge straight into the enemy lines without sustaining heavy losses. Instead, traditional cavalry groups, like the hussars, had to capitalize on their incredible speed and precision on the battlefield. Using effective hit and run tactics, a group of sword wielding cavalry could easily sway a battle well up until the First World War, where the advent of tanks, barbed wire, and the machine gun would put an end of all cavalry combat. Cavalry were so effective largely due to the lack of counter tactics to use against them. During this time, there was a sort of lull before the advancement of the Gatling gun that allowed cavalry to evade tactics that could defeat them head on. They were especially effective at running down routed troops and supply lines. Predictably, the weapons used by these cavalry were very different from the weapons we know from the era of traditional martial arts. The rapier, which had evolved to survive during the Renaissance would soon be replaced be the sabre that was favored by the cavalry contingents. (Coe, *Swords and Hilt Weapons* 1989)

Remaining Practice: Survival of Martial Arts

Despite the lack of any true traditional martial arts in military combat, some traditions were able to continue both in the military and in other areas of society. During the Renaissance, the rapier became a staple in many societies as the side armament of a gentlemen. They used these swords in duels, for status, and even in self-defense if necessary. However, the continued use of the gun and the changes to philosophical and political ideals that occurred in the Enlightenment saw gentlemen's use of the sword decline. No longer does your average city dweller in Venice carry around a sword at all times, nor do duels continue to be a mainstay in political and judicial areas. As these changes evolved, the use of swords began to become exclusive to nobles of both political and military backgrounds. While certain countries' soldiers continued to have blade armaments as side weapons, the continued evolution in the military led to an almost distinctive image of swords as officer and cavalry weapons. An officer was scarcely seen without his sabre or small-sword, while the contemporary kings and leaders of countries would look out of place without one. This application of swords was one of the few ways that martial arts practices were able to survive. While not all, perhaps not even a majority, of the officers, nobles, and leaders would carry the sword for anything other than for show, a vast number of them knew the ins and outs of their weapons and were taught to adequately use them. At this point, the martial arts practices became a talent particularly of the upper class, whether they be military or not, while the common man lost all connection to traditional martial arts that had been present during previous ages.

As we have seen, most of the martial practices that survived up until this period have revolved chiefly around the sword. Perhaps because of the sword's "jack of all trades" characteristics it was able to be useful throughout the ages, but for whatever reason, the rest of a typical knight's armament that had been used throughout the medieval and Renaissance era had been mostly eliminated. Staff weapons such as poleaxes and halberds, maces, and spears had largely seen the end of their usefulness on the

battlefield and in society in general. Wrestling would eventually be altered into the early forms of boxing or Olympic wrestling that we know today. Even daggers, which had always been a precious side armament to a medieval knight or Renaissance duelist had steadily been replaced or removed. To alleviate some of the limitations of guns, such as the user's vulnerability while reloading, daggers steadily evolved into the bayonets that would become standard military equipment in the 18th and 19th centuries. (Coe, *Swords and Hilt Weapons* 1989)

Due to the degradation or completely deletion of other forms of martial combat, the sword took the main stage and through this the art of fencing was "born". Fencing had always been around in one form or another since the medieval era, but it was the Renaissance rapier that truly brought about the fencing that we recognize today. It would continue to evolve with the introduction of sabers and small swords, and would steadily see the removal the offhand dagger that was ever present in rapier combat. Fencing as a form would see its uses as a hobby or talent of the upper class of political and military landscapes, with officers and general noble gentlemen of the times having some knowledge of the traditional fencing practices.

Traditions Struggle On

Fencing had always been an important part of a knight or martial noble during the medieval era and Renaissance, as a one's martial skill was often tested. However, it wasn't until well into the Renaissance that the semblance of fencing that we know of today began to take form. By the 19th century many practitioners of traditional western martial arts did so on the time of previous generations, following the masters of the Renaissance and their treatises to the letter with their practices. Very few masters of the time produced their own methods, and even fewer created the elaborate treatises that has been seen from Renaissance masters.

However, a few masters of this time did create their own resources for reaching out, explaining methods, and teaching prospective students of the art. These masters were often secluded, with very small amounts of followers, as their practices were no longer part of the world. The practice of fencing was the only true version of the art form that continued, with most of it being centered in Spain during the Baroque period from 1600s-1725 (http://en.wikipedia.org/wiki/Baroque). However, these few remaining bastions would not be enough for the practices to survive. Instead, the practices eventually died out, but they would not be forgotten, and perhaps they could even be revived.

Revival Time Period

With the arrival of the 20th century, all possibilities of traditional European martial arts in the military had long been exhausted. Swords remained only as a symbol for officers. With the advancements of guns now well into the machine gun era, in addition to the creation of tanks, cavalry ceased to exist in the contemporary militaries, and thus ended any martial use of the sword. At this point in history, traditional European martial arts were removed from any military application, and instead were picked up by the hobbyists of upper/middle classes of the 20th century. As seen with fencing, some martial practices could survive the test of time, even if they were no longer as functional as they had been.

Despite fencing's continuity, there was no sustained practices of the traditional martial arts that had been prevalent during the Middle Ages and the Renaissance, through the 18th, 19th, and 20th centuries. Fencing, and even wrestling, evolved into the versions of the sports we see today, while other practices involving more traditional weapons such as the longsword and poleaxe completely disappeared. Although historians had always studied the past, it wasn't until around the mid-20th century that interest began to surface into the medieval methods of the past. Up until the late Renaissance, masters of martial arts had been improving and reiterating the practices of the past, but had always continued the

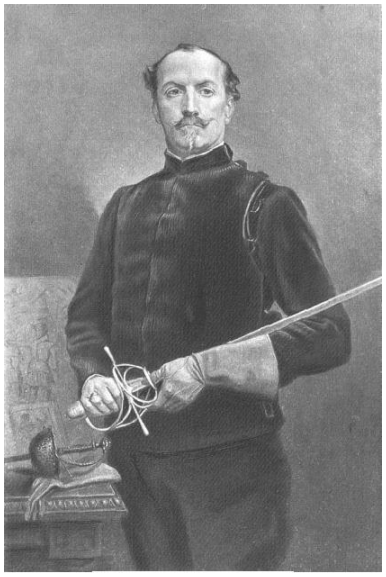
line by adding their own knowledge and methods. But by the late 18th century, any masters that still remained had almost exclusively focused solely on weapons that remained "useful" in their present times, such as the sabre and epee, instead of the combined knowledge of all the previous masters before them. It was to be expected that as specific weapons lost any value as a military tool or hobby practice that they would also lose the efforts of any masters to continue their methods.

This designation of specific martial practices as insignificant would lead to methods utilizing weapons such as the longsword and poleaxe to become "lost arts." This was further exemplified by the fact that many of the medieval and Renaissance treatises had been "lost" in libraries near the end of the Renaissance, further magnifying the dying out of the traditional practices. For instance, the oldest known treatise, the I.33 manuscript, was known to be in solely in possession of the Duchy of Sachsen-Gotha from the 1500s to around 1945. For a 5 year span the location of the manuscript was unknown until it turned up in the Royal Armories in the Tower of London sometime during 1950 ("Walpurgis Fechtbuch MS I.33, wiktenaur.com). The I.33 manuscript is just one example of how throughout their inception until very recently, these treatises had been held by a select few and had not been able to properly share their contents with the world.

History Survives

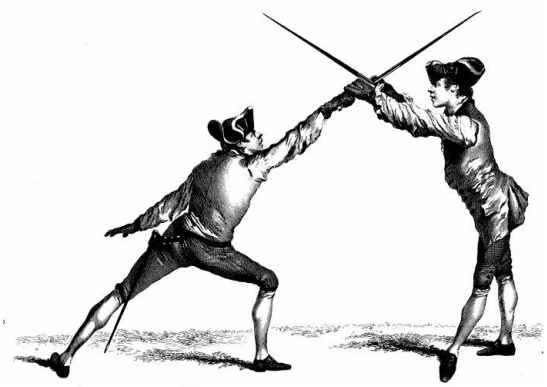
This modern rediscovery cannot be said to be caused by one singular event. Historians had always been recording and studying the past in detail, and the medieval era was no exception, but during the late 19th and 20th century the interest in the martial practices of this era and the Renaissance became increasingly appealing to historians. Perhaps partly because of the resurfacing of some manuscripts, perhaps because of some other unknown intention, historians who were devoutly interested in studying the martial practices of the "lost" ages began having more influence in the world.

One such man was Alfred Hutton, a 19th century Englishmen and Victorian Officer of the King's Dragoon Guard. Hutton was born in 1839, and by the age of twelve had already begun learning the art of fencing Henry Charles Angelo, who was the appointed Superintendent of Sword Exercise of the Army.



A portrait of Alfred Hutton, historical fencing advocate and avid practitioner.

He grew up to become an experienced fencer and martial practitioner, often urging alterations to military policies to enhance training of soldiers with historical methods of fencing. He was even of the belief that a soldier who could competently wield his own bayonet could take down any good swordsmen. His views, however, were more often than not regarded as too theoretical for practical instruction. (http://en.wikipedia.org/wiki/Alfred_Hutton)



An example of the imagery used in Old Sword-Play. *This particular image depicts the disarm after an effective parry.*

Despite the lack of acceptance of fencing practices in the military, Hutton continue to be a pioneering advocate and practitioner of historical fencing. He penned numerous treatises on swords, such as the sabre, and even on bayonets. He also wrote many novels and critiques on the subject, which served to further enhance his teachings through a better understanding of the practices themselves and where they came from. One book in particular, *Old Sword-Play: The Systems of Fence*, as a stellar example of his continued work in the field and constant study of past masters. The book is filled with numerous plates from previous masters, including DiGrassi. In it he also included his own views and advice on the numerous techniques that he displaces, and even includes a history of the eras of fencing that existed before his time to further enrich the reader to the subject they were learning. He was a passionate practitioner who, mirroring the efforts of Renaissance masters such as Joachim Meyer, fought hard to ensure that the history and practices of this art would be preserved. (Hutton, *Old Sword-Play*)

Hutton was deeply interested in the older methods used during these previous times and set about composing works on the relevant techniques taught in the 16th, 17th, and 18th centuries (Hutton, *Old Sword-Play*). Although he was more of a fencing master in the modern sense, rather than the traditional masters of fence like Liechternauer, he used many old images and techniques in his novel to enhance his

teachings. But there was another practitioner of note during this time, one both friend to Hutton and similar to his particulars of study.

A caricature of Egerton Castle by Leslie Ward, captioned: "He insists that his pen is mightier than his sword."

Egerton Castle was a 19th century Victorian who studied the traditional fencing practices. He had an impressive repertoire of studies, books, and experiences about the subject by the time of his death in 1920, having studied throughout his life and been captain of the English sabre and epee fencing teams during the 1908 Olympics. Like Hutton, he advocated the continuation of the practices of the older fencing masters and strove hard to ensure their survival. One of his most notable works, *Schools and Masters of Fence from the Middle Ages to the Eighteenth Century*, was a detailed and enriching history of the European martial practices. Again similar to Hutton, while he did advocate the study and learning of the techniques themselves, he encouraged an understanding of where these techniques came from. Castle lamented the fact that the expansive comprehension that the Renaissance had enabled of the fencing practices would soon be wasted as the necessity of fencing all but disappeared. He states, "It can

safely be asserted that the theory of fencing has reached all but absolute perfection in our days, when the art has become practically useless. Under the reign of scientific police, arms are no longer a necessary part…" (Castle, *Schools and Masters*, pg 3). He considered it "paradoxical" that the development of the "Art of Fence" resulted from the creation of firearms. (Castle, *Schools and Masters*)

A common theme that arises from these practitioners of modern study is that of comprehension above iteration. By the 17th century, treatises ceased to be useful in martial practices of nations, and instead were relegated to personal interests. Masters were no longer creating impressive and beautiful images of techniques to be learned by their students, and instead focused on teaching students in the modern times of the older traditional methods of the past. Even then, the teachings that remained were those of somewhat "useful" weapons, others such as the longsword and poleaxe having fell behind. However, future generations would eventually be more thorough in their examination of the past, and by the 20th century the arcane techniques of these aged weapons would resurface once again.

Internet Revolution: Revival of the Martial Practices

It wasn't until the 1990s that the true revival of the martial arts of Europe got into full swing. When the rediscovery began in the mid-20th century, practitioners and historians who had begun to analyze these ancient techniques did not have adequate tools to share information with one another. A recent find of a lost manuscript in Europe might take time to be relayed to another practitioner in another part of the world. It is for this reason that the internet became the greatest boon for martial arts practices since the manuscripts themselves were created.

Since the internet's inception in the 1980s, the spread of information around the world increased dramatically. The internet allowed for one to upload information from their research online to be

accessed by anyone else in the world who found their information. These researches could now more easily contact one another with the advancements in communication. As a greater number of people began to use the internet, due to its increased availability, the amount of interest in the lost European martial arts greatly increased. A large percentage of the population still considered medieval knights to be massive brutes in armor who swung hefty and unwieldy weapons with no poise or skill. Certain historians, who had studied the warriors of the Middle Ages and Renaissance, used the growing information network to spread the knowledge of the true practices of these eras.

At the turn of the 21st century, this interest in the martial arts of old world would reach new heights as internet usage reached higher. By 2012, 34% of the world used the internet, and with this outlandish amount of usage, the number of people who found the topic of European martial arts interesting began to skyrocket. Organizations under the new designation HEMA (Historical European Martial Arts), began to surface around Europe and even parts of America. These organizations were wholly dedicated to reviving the practices of the Middle Ages and Renaissance that had been lost over the centuries. As noted earlier, these new practitioners would study the old master's techniques and teach them in full, attempting to remain historically accurate rather than iterate from their research. As certain martial practices survived the ages to continue to the present day, it was important when studying the ancient methods to stay as close to the source material as possible, namely the manuscripts themselves.

This image is from the ARMA website, showcasing their practices in the modern day to study the martial arts techniques of the Renaissance.

Once such organization, ARMA, the Association for Renaissance Martial Arts, was founded in 1996. Its mission is to research and revive the teachings lost to time from the Medieval Age and Renaissance. Similar to older masters, from Joachim Meyer in the 16th century, to the more "recent" Egerton Castle of the late 19th Century, ARMA believes that these practices have legitimacy even if their weapons are no longer useful for warfare. It is important to them that others understand that European martial arts has a rich and expansive history, akin to those of eastern cultures that are so readily and easily accepted as "real." Unlike the ancient schools of fence that arose in their respective eras, modern "schools" of practice are more akin to a conglomeration, openly sharing info with anyone who wishes to learn, a task made easier by the powers of the modern age.

The ARMA tactic of revival was not the only way that this restoration presented itself. ARMA and other associations like it used new technologies and built themselves as a community of practitioners who enjoyed the art. Other, more traditional methods would be employed by others. The Higgins

Armory Museum is one such example. The Higgins Armory Museum was first opened to the public in 1931, the dream made reality of a Worcester industrialist John Woodman Higgins. It became the first and only museum of its kind in the entire Western Hemisphere. It has numerous collections of an impressive quality (http://www.higgins.org/history-museum).

The Higgins Armory Museum was not just a museum for one to peruse the arms and armor of old, but also a place to practice it. The Academy of the Sword and Higgins Armory Sword Guild are two expansive programs at the museum that trained students in these lost arts. The Sword guild was founded in part by Patri Pugliese, a historian of science, dance, and most importantly, fencing. His work in uncovering the lost martial arts has earned him the title as the father of the modern movement in studying European swordsmanship, as he provided much of the texts that first introduced these concepts (http://en.wikipedia.org/wiki/Patri_J._Pugliese). Overall, the history of rediscovery is almost as important the history of the European martial arts itself. The continued advancements and practices of these lost arts owe their existence to both the distinguished few, who uncovered these secrets and spread them throughout the world, and to the growing mass of the younger generations, bent on learning to live by the sword.

Physics and Principles of Human Movement

By: Daniel Haggerty

Physics

Understanding the physics behind human movement is essential in martial arts. The application of force and the dispersion of force are fundamental to the art of combat, and a competitive edge will be held by the combatant who best appreciates the science behind these movements and can apply the knowledge during a contest. The three basic types of movements for any object or body are linear, also referred to as rectilinear or translatory, angular or rotary, and curvilinear (Arus, Dyson). Linear motion is described as a movement of all parts of a body in a straight line, where all parts move the same distance in the same direction (Arus). Linear motion is uncommon in human movement, except as the result of angular movement of parts of the body. Angular movement is the movement about an axis of a part of the body. Most of human movement is angular, with the axis at the joints (Dyson). In martial arts, even the straightest movements either in attack or defense utilize angular movement since all of the limbs

are anchored to joints and the body or limb must pivot to change position (Dyson). Curvilinear motion is a movement of the body in a curved line; a jump is an example (Dyson, Arus).

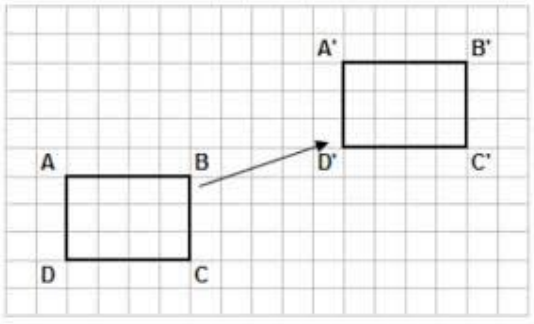


FIGURE 1 LINEAR MOTION

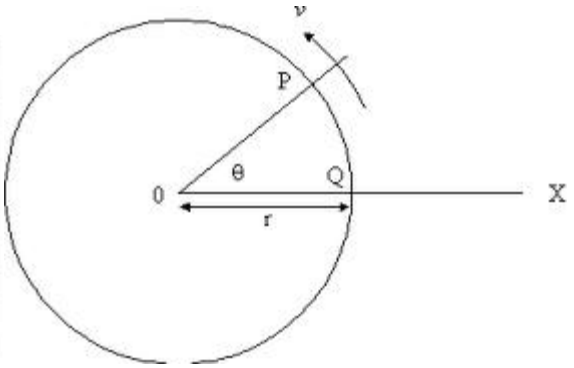


FIGURE 2 ANGULAR MOTION

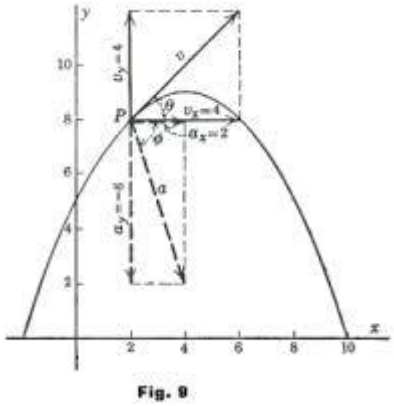


FIGURE 3 CURVILINEAR MOTION

In the case of human movement, most linear movement is achieved through the utilization of angular movement. In the case of walking, both legs are moved angularly, with the end result being a liner movement of the entire body. Another example of this is a wheel. The wheels parts have angular motion which causes the entire wheel to have linear motion (Dyson). In the case of martial arts, angular motion of the limbs is used both to strike and to achieve a linear movement, often times simultaneously.

Speed is a very important factor in martial arts. The average speed of an object is the distance travelled by the object divided by the total time taken for it to arrive. This could be the movement of a fist or foot in an attack, the tip of a sword or dagger, or the movement of an entire body. Speed is critical in a combat situation, because in a combat situation nothing stays still and timing is extremely important. However, speed is not the only factor in determining the force applied, and without acceleration the speed is not necessarily useful. The force determines the effectiveness of the attack or defense, even with a high speed, applying a small force will not always be extremely effective (Arus).

The kinetic energy of an object is determined by the equation:

$$E_k = \frac{1}{2}mv^2$$

where E_k is the kinetic energy, m is the mass of the object, and v is the velocity of the object. Upon examining this equation, we find that the energy contained by an object is dependent solely on its mass and its velocity. The mass of the object obviously is an important factor in finding the objects energy; if both a tennis ball and a car were moving at one meter per second, the car would of course have much more energy than the tennis ball. However, a look at the equation for kinetic energy reveals that the velocity is a much more important factor in determining the kinetic energy. The velocity term is squared before being multiplied by the mass; this means a change in velocity affects the kinetic energy much more than a change in mass. So, if a person is able to accelerate a weapon or fist to a greater before collision, the energy behind that object will be much greater even if the mass is not huge. The kinetic energy of an object is very important in the outcome of impact.

Isaac Newton's second law of motion states that a force is equal to the mass of an object multiplied by its acceleration. The rotation about the axis accelerates the fist, foot, sword, etc. and this acceleration will decide the amount of force applied. It is important to note that in the case of angular motion, the mass of the object accelerated is no longer used in the equation for force, but moment of

inertia is. The reason for this is that the arrangement of the mass about the axis can drastically change how difficult it is to accelerate the mass. Rotating a flat disk with the center point as the axis is much easier to do than rotating a rod of the same mass with the endpoint as the axis. This is the concept of the moment of inertia, the difficulty of accelerating something depending on the axis it is being rotated about and the arrangement of the mass about that axis. The force therefore depends not only on the acceleration, but on the distance of the mass from the axis of rotation, and the arrangement of that mass. A good example is a sword with a heavy hilt. If you hold the sword by the tip and rotate it around, it is very difficult to switch directions back and forth quickly. However, if you hold it by the hilt, this becomes much easier. If most of the mass of the weapon is closer to the hand, the weapon will be much easier to accelerate, and a greater speed can be attained easily. However, if the mass is distributed on the end of the weapon, it will be much harder to swing around, but a much lower speed will be needed for an effective hit to be applied. This is the difference between an axe and a sword. The axe has most of its mass at the end of the handle, while the sword's mass is more evenly distributed along the entire length.

Momentum is another important property to consider in martial arts. The momentum of an object is calculated by multiplying its speed by its mass. This clearly tells us that a less massive object can have the same momentum as a more massive object, by having more speed. Momentum is a value used to calculate the outcome of a collision, and so is very relevant to applications in martial arts. Momentum is conserved, which means that the result of a collision is to have two or more objects that have the combined momentum equal to the combined momentum of the objects before the collision. This means that when one object is stationary and a second object collides with it, the momentum is distributed between them based on the conditions of the collision and the type of collision. In combat, maximizing the momentum of your fist or sword before striking the opponent will cause the momentum transferred to be much greater, which means the hit will be much more effective.

The tip of a sword can gain much speed much more easily than the parts of the sword closer to the handle; however, the leverage at the end of the sword is far inferior to the leverage closer to the hand. The fulcrum in this case is the wrist or the hand, and the greater the distance from the fulcrum the force is applied, the less the force is required to move or stop the object. A sword will act like a lever, and in order for the sword to remain in equilibrium, the equation

$$d_1F_1 = d_2F_2$$

where d_1 is equal to the distance from the fulcrum that the first force, F_1, is being applied, and d_2 is equal to the distance from the fulcrum that the second force, F_2, is being applied. In the case of a sword, the first distance will be very small, since the force is being applied almost exactly at the fulcrum of the sword. If the second force is being applied to the tip of the sword, the force required to reach equilibrium will be extremely small. This must be considered when deciding which part of the sword to strike or block with. The tip of the sword will have much greater speed, but the part of the sword closer to the handle will have much greater leverage.

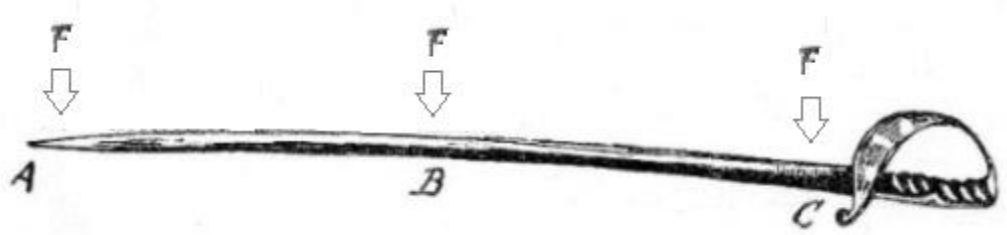


FIGURE 4 SWORD DIAGRAM DEMONSTRATING LEVERAGE

In the diagram in Figure 4 we can see a force F being applied at three different places on the sword. The first point the force is being applied is point A. The point is at the end of the sword. When this force is applied, the force required to keep the sword from being pushed back will be large. Since we know that when the sword is in equilibrium (not moving) d_1F_1 is equal to d_2F_2, we can see that when d_1 is large, then either d_2 or F_2 must also be large in order to keep the sword in equilibrium. The person

applying F_2 is the one holding the sword, which means that he is applying his force just below point C since he is holding the handle of the sword. Let's just say that the distance between points A and B is one foot and the distance between points B and C is one foot. The distance between the fulcrum of the sword and point C we will say is .5 feet. The force needed to block the strike at point A is $F_2 = \frac{(2\ Feet)*F_1}{(1/2\ Foot)}$ = 4*F_1. That means it will take four times the force of the strike in order to block it. In the second case, the force is being applied at point B. Again putting this value into our equation we find $F_2 = \frac{(1\ Foot)*F_1}{(1/2\ Foot)}$ = 2*F_1. When the strike is in the middle of the sword at point B, it will still require twice the force of the strike just to stop it. At point C, we discover that $F_2 = \frac{(1/2\ Foot)*F_1}{(1/2\ Foot)}$ = F_1. This means that when the strike is directly at the point the strike is, the forces need to be equal in order to block the strike. This demonstrates how leverage can be used in combat to gain advantage, and how important it is to understand leverage especially when sword fighting, or fighting with almost any weapon.

Psychology

Understanding the physics of a fight is of course immensely valuable in combat, and the one who truly understands these concepts may gain a considerable advantage over their opponent. However, these principles are not the only ones that govern combat. A real fight is as much a mental battle as a physical one. The combatant who can make his opponent believe he will win is already halfway to victory. Throughout time, methods to intimidate opponents have been used in order to gain a mental edge during combat. The Gaesatae were said to be warriors from the Alps who fought against the Romans in 225 BC. These warriors were known for their supreme confidence, and would march into battle completely naked, painted orange or blue, screaming war cries. This would frighten opponents and give the Gaesatae an edge (Polybius, Histories 2:28. 3-7). The warrior monks of Japan, the sohei,

would use their opponent's superstition and religious beliefs against them. They would bring beads into battle which were said to be able to call the gods and put a curse upon the monks enemies. The opponent would believe they had been cursed and were doomed by fate to lose the battle. They would also carry a shrine with them into a battle or a village which was said to house a god. The people's beliefs in the religion during that time period was so strong that no one would dare attack the shrine or those carrying it. The warriors of the Philippines were legendary and said to be unstoppable. They were known to never quit until they were dead. Accounts of Moro fighters being stabbed by a bayonet and pulling themselves further onto it in order to get close enough to the enemy for a strike were not uncommon during the U.S. occupation in the 1800s. The reputation of being unstoppable gave them an advantage, as opponents were too afraid to go head to head with them. Some say that the .45 caliber pistol was developed because the .38 caliber was unable to stop a Moro warrior even they were hit several times (Paman). Even today, it is common for wrestlers to weigh in completely naked in front of their opponents before the match in an effort to intimidate the others. All of these are ways to defeat the opponent in the mental battle which is as important to the fight as the physical aspect. Methods to do this have been used all around the world, and have existed as long as combat itself.

Japanese Martial Arts

Training

Early in the development of Japanese swordplay, training techniques had to be developed. Training with a real sword was near impossible because of the risk of wounds or death. Two methods were created to solve this problem: drilling the techniques without actually fighting, and using a fake sword to spar with. The two different drills that were done were suburi and kata. Suburi is the practice of swinging the sword in synch with the sensei, practicing the swings over and over. Kata is practicing pre-defined swings and movements. The kata were developed to teach a trainee what to do in different situations. The kata that were developed covered many situations, including how to fight someone who

is wielding two swords. Both methods were used to train swordfighters, but these methods are boring and can only teach a limited piece of swordplay. To make up for the shortcomings of suburi and kata, wooden swords, or bokuto were used to spar without the risk of an accidental death. Tampo yari were practice spears used for sparring, with the tips of the spear rounded and padded so they were no longer deadly. The bokuto were made to be as close to the same weight and balance as a real sword (Turnbull).

FIGURE 5 STUDENTS TRAINING WITH TAMPO YARI

Another class of warriors besides the samurai was the warrior priests, the sohei. These were ferocious fighters who became increasingly less interested in religious practice and more interested in military might. The monasteries each began raising private armies in order to protect their way of life. The warriors would be picked to be trained for priesthood, but the real reason was purely to be trained for warfare. Peasants and criminals were often recruited into priesthood. The main weapon used by these priests was the naginata. The naginata was a curved blade attached to the end of a long pole, and could be a devastating weapon. Besides this though, the priests took advantage of the superstition of their opponents to win their battles. The monks would carry beads and call their gods to curse the opponents, which would allow them to gain the upper hand in a fight with a superstitious opponent.

They would also carry a portable shrine into battle with them which was said to house a god. The opposition was too afraid to ever attack the shrine, because the religious doctrine stated that it would be the same as a direct attack on the diety. The warrior monks often engaged in disputes with other temples. The battles were most often over land or notoriety, and almost never an actual religious dispute. The monks would go and burn down the temple of their enemies.

Weapons

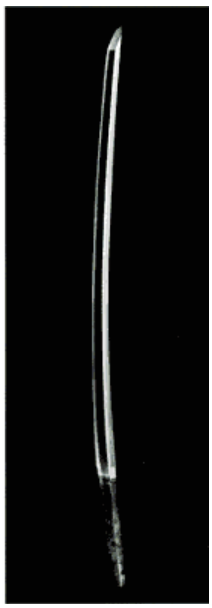


FIGURE 6 14TH CENTURY JAPANESE BLADE

Originally, the swords used by the Japanese were straight swords which came from the Asian mainland. Because the swords were straight, they were primarily used for a stabbing technique rather than the slashing that the samurai are famous for. The swords were not used extensively because the bow and arrow was the principle weapon used in the time period. Slowly the swords developed a curve which allowed a slashing attack to be effective (Sinclaire). The long curved blade used by the samurai is called a katana. The katana is noteworthy in its construction. The blades were strong enough that the fighter could parry a direct attack. The European blades of the time were not strong enough to withstand this, which is an important factor in the way the samurai fought with the katana. The sword could be used with two hands since a shield was not needed. The sword acted as both offense and defense, and so a shield was unnecessary (Louis). The blade was curved in order to allow a slashing attack to be effective. The curve in the sword allowed the blade to stay in contact with the target for a long enough period of time to do damage. As the blades developed, the style of fighting also developed, however, the bow and arrow continued to be the standard weapon (Sinclaire).

The most famous weapon of Japan is obviously the katana carried by the Samurai. Also carried by the Samurai, however, was a short sword known as a wakizashi. It was often paired with a longer sword, called a daisho or katana, but because this weapon was favored by commoners for self-defense, it also often was used without the longer counterpart. The wakizashi was of length somewhere between that of a short sword and that of a dagger. The classification is “shoto” or “short sword”, and it ranges from around 60 centimeters to around 30 centimeters. The Samurai would often have two swords with them. Their longer sword, used for most of the combat and sometimes used with the shoto simultaneously in a method called Nitoken, and the shorter sword, the wakizashi. While a Samurai would sometimes put away their katana when inside or in the audience of a lord, they were said to never be without their wakazashi. This they always kept at their side, in case they needed to use it. Because of this, the combat techniques used when fighting with a wakizashi were very important, and the martial art associated with this is called Kodachijutsu. The techniques focused on facing and disarming an opponent with a longer sword, but also on fighting an opponent also carrying a wakizashi. The sword was used both parrying and stabbing, and also slashing since it was curved similarly to the katana. The techniques for the wakizashi and the katana differed in several ways. The distance when fighting would have to be much closer when wielding the wakizashi because of the shorter length. This caused grappling to be an important section of techniques to be learned when training with the wakizashi. However, the smaller size of the sword allowed it to be easily wielded with just one hand, and also allowed much faster movement. It was important when in combat with this weapon to move close to your opponent, as it is more difficult to block a thrust from a short sword when they are close than if they are at a range that the longer sword can reach.

FIGURE 7 MARTIAL ARTISTS DEMONSTRATING DEFENSE AGAINST A DAGGER ATTACK

Another weapon often used in Japan was the naginata. The naginata was a short blade mounted on the end of a pole and used in a similar fashion to the halberd, with the exception that the naginata was able to be used as a slashing as well as a stabbing weapon. This weapon was used mainly individually. The naginata could be used to deal with multiple enemies at once, as it could be swung around in a slash and keep opponents away. However, this weapon was rarely used by troops because the fighting style when wielding one was not conducive to effective combat when in formations of troops. The weapon was often swung and used to slash opponents and didn't prove effective in these situations. This weapon was replaced by the yari, a spear primarily used for thrusting, for troops in ranks.

FIGURE 8 NAGINATA

FIGURE 9 YARI SPEAR TIP

Chinese Martial Arts

In China, the practice of martial arts was very common, and was much more a part of everyday life than in other regions or than it is today. Martial arts were practiced for exercise, spiritual balance, and also for defense. The original reason for martial arts to be developed was to be used in combat, and its other uses were less common initially. The martial arts practitioner developed a style by combining the different systems he studied, or studied a specific style and tried to master all of its techniques. The system could be a set of techniques and training methods passed down a family, or a village or a school. There were hundreds of these systems all with different history, practice methods,

and techniques. The three main categories that these systems addressed were striking, grappling, and weapons. The techniques for each of these categories obviously varied. Striking is hand to hand combat that involves kicks and punches, commonly referred to as Chinese boxing. This boxing is not like the western sport of boxing, rather it is just a term for the fighting practice. Grappling is wrestling and throwing your opponent, which is very important in a hand to hand combat situation. Weapons is fighting with any of the Chinese weapons, the training and practicing for this was very important in warfare (Kennedy).

FIGURE 10 MARTIAL ARTIST RUNNING UP A WALL

Chinese boxing has bee culture. In these movies you might see a martial artist run up a wall, withstand a hit that should break bones, jump ten feet in the air, or simply poke an opponent in a specific spot and paralyze him. These all seem impossible, however techniques like this are often recorded as something a true master could accomplish if he was disciplined. These methods seem to just be exaggerated, but some were practiced. For instance, monks would train to develop “Diamond Armor” by being hit continuously in the chest and back, to become tough enough to withstand the most powerful blows. The walls at that time were made of mud and stone, and it is possible monks trained to easily climb them because of the rough surface and abundance

of footholds (Kennedy, Cheong). The normal training methods, however, are better to focus on. The practitioner would train by following certain forms that were determined by the system he was following. Many practices claimed their method was superior, and would keep the techniques a secret. The training methods involved general strengthening techniques as well as forms to follow. The forms would include repeating a certain punch or kick many times, or repeating a series of punches or kicks. Another large part of training was sparring. There were several different types of sparring, just used to keep the combatants safe. Those training would either hold back their punches, or lighten them before making contact, or sometimes wear padding or armor and fight full contact. Obviously this was a very important part of training because it put into practice the techniques being learned.

There were approximately fifteen primary weapons used in China. There were also many other

FIGURE 11 MARTIAL ARTISTS PRACTICING BOXING

weapons of which most were used for throwing. The fifteen core weapons were:

Sword Broadsword Spear

Halberd	Rod	Hook
Staff	Whip	Mattock
	Mallet	Chain
	Lance	Dagger
	Axe	Bow and Arrow

These weapons were all used extensively, and the technique varied depending on the weapon used. However, a general technique was developed. The Chinese realized that a stabbing attack was much more effective both in concentrating the power and in avoiding a parry or counter, and so this attack was much favored over a swinging attack. The sword primarily used was a double edged sword that was straight and pointed. The Chinese also used a broadsword, but this only had one edge. It is said to have evolved from the knives commonly used in the second century. The sword was also one of the two weapons which were used in tournaments. The other was the spear. The technique with the spear was developed in warfare. The spear was not used as a projectile in China. This was because in China an effective crossbow was developed much earlier than it was in Europe, and the Chinese used that instead of a throwing spear. The spears used were eighteen feet long, and had a blade as well as a point. These were wielded by foot soldiers (Draeger). When training, students would use wooden weapons to spar with each other and learn the techniques. They would also practice forms using the weapons themselves.

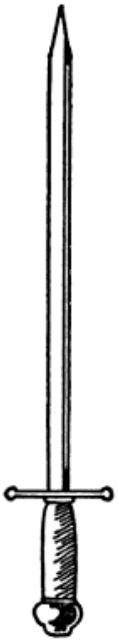


Fig. 15 Double-edged sword

Filipino Martial Arts

Development

The martial arts of the Philippines, called Kali, were heavily influenced by outside cultures during their development. It is accepted that the fighting style originated in India and was brought by those who travelled to the islands via land bridges which no longer exist. Malay, Chinese, and Muslim influence were also all very important in the development of the fighting style. However, despite the vast influences that Kali saw, there was never anywhere else in the world which developed a fighting style which integrated double weapons as thoroughly or used them in a style as sophisticated as the Philippines did. This is unique to the Philippines. The people prided themselves on the fierceness of their warriors and the Spanish hired them and allied with them in their fights against pirates and against the rebelling Chinese. The double weapon style that had been developed thrived when the Spanish rapier and dagger were introduced. The styles of two weapon fighting were easily adapted to using both the shorter and longer weapons in conjunction and created a devastating effectiveness (Galang, Wiley).

When first discovering the islands, Portuguese explorer Ferdinand Magellan hoped to conquer the island of Mactan with his force of 49 Spanish conquistadors. As he landed his troops on the island he was met by 1,050 natives armed with spears who quickly destroyed the invading force and killed Magellan. The fighting styles of the natives were much superior to the Spanish and so the force was easily dealt with. However, the Spanish returned and eventually managed to colonize the islands by using their firearms which were superior to the weapons of the natives. During the time of the Spanish occupation, Kali was outlawed, because it was far superior to the fighting styles of the Spanish and was a threat to the occupying force, despite the superior technology of the Spanish. Although it was

technically outlawed, its practice was continued through ritual dance and during shows there would often be a mock sword fight to conclude the dance. The ritual dances were called sinulog and were often performed for the enjoyment of the Spanish. The practice only survived because of the few dedicated disciples who continued the tradition despite the laws against it. The practitioners were very diligent and developed their martial art very rigorously. The focus was accuracy and speed, because the Spanish had sharp swords which could cut through the wooden Filipino weapons. The focus of the practice thus became disarming and defeating the opponent with a single well executed blow, rather than allowing a fight to last. This required extreme accuracy and agility which can only be attainted through rigorous training. The focus was on strikes to the nerve centers which would disable the opponent immediately. (Wiley) Because of the training as mercenaries and colonial soldiers, the rebellion of the indigenous population against the Spanish was successful within a month (Galang).

Sinawali

Sinawali is a part of Kali that is not so much a specific system under the umbrella of Kali, but rather is integrated heavily in all systems of Kali. Sinawali is translated literally as woven. Sinawali is the practice of integrating rhythmic movement as an important aspect of Kali. Generally sinawali drills are used as ways to improve skill, and are not drills with specific attacks or defenses. Both hands are used in sinawali and the drills are useful to develop both timing and coordination. An example of a sinawali drill is called Heaven Six and it involves striking with both the forehand and backhand, wielding a weapon in either hand (Rister). Sinawali does not exclusively use two weapons although it is a common misconception that it does. Sinawali is one of the most important areas of Kali which sets it apart from other martial arts, and it is one of the defining aspects of Kali.

The most unique aspect of the Filipino fighting style is its emphasis on double weapon fighting. This style of double weapon fighting promotes ambidextrousness as well as discouraging the fighter

from favoring a specific side or stance. This also causes the fighter to be unbiased which helps fighters adapt to many different situations. Even the drills which utilize single weapons are always practiced ambidextrously. Each drill is repeated for either side and practiced until the fighter is equally proficient with both sides. Neither side is favored despite the fact that one side is almost always more comfortable for a fighter to use. This not only serves to help the fighter adapt to other situations, it also discourages developing patterns that can be easily exploited by the opponent (Galang).

Training and Practice

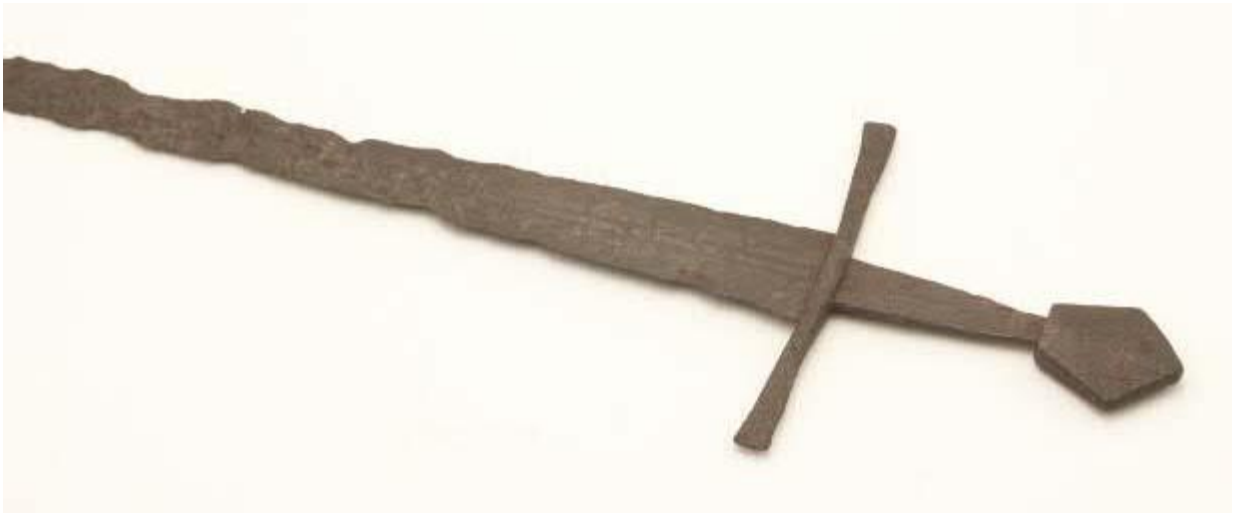
The martial arts here are practiced with real combat situations always in mind. While drills are practiced, sparring is stressed as the most important aspect of the training. The drills that are practiced serve to help gain a complete understanding of a certain move or attack, but these drills assume perfect conditions which are hardly present in a real combat situation. Because of this, the drills are used to teach muscle memory and to help break down the move to be sure it is executed properly, but these drills are used mainly to supplement the main training which is the actual sparring with a partner or partners. Sparring allows the moves to be used in the imperfect conditions of real combat. The emphasis on sparring is important but the drills also provide a way to cover many different situations so that the fighter can be sure to experience a variety of conditions that might not always appear during a sparring match. The arts focus on real combat situations also takes into account that there might often be more than a single attacker. The bilateral fighting style helps to manage this, and the grappling is taught with this in mind. Often the throws will be taught in a way that allows the fighter to stay ready to fight other opponents. Because of this focus on multiple assailants, the grappling is optional and not an integral part of the practice (Wiley). However, the joint manipulation that is practiced in unarmed combat styles is taught using a blade. Using a blade, the joints can be manipulated in the same manner as one would in unarmed combat, but less accuracy is needed, and the blade against the skin creates a “pain compliance

point" which makes manipulation easier. While grappling is not necessarily emphasized, the close-range combat using a double edged dagger is a large part of the combat system (Cody).

Swords

By: Andrew Aveyard

One-Handed Swords



Artifact: Excavated Sword Accession Number: 1904

During the Middle Ages and the Renaissance, one-handed swords saw frequent use in both duels and wars. These swords tended to be lighter and faster, but also weaker than their two-handed cousins that were outliers at first but more widely developed as specialized weapon types later on. The swords ranged from having curved, single-edged blades, to straight double-edged blades, depending on location and culture. In particular, Europe had a variety of different swords that could be wielded with one hand and an extensive range of techniques for each one.

One type of one-handed sword was the arming sword, also called the knight's sword. The arming sword was the standard military sword widely used from 11th to the 16th century. It was the

sword of choice for the medieval European knight and was generally used while in armor (hence its name).

The arming sword generally had a single-handed cruciform hilt with a straight double-edged blade. The length of the blade typically ranged from 69 to 81 centimeters; however blades with lengths ranging from 58 centimeters to 100 centimeters were also recorded. The sword weighed about 2.4 pounds and had a 'wheel' pommel starting in the 11th century. [1] The 'wheel' pommel became the main type of pommel seen on this sword between the 13th and 15th centuries.

The sword was designed for cutting and thrusting attacks and usually had good balance. Since the sword could be wielded in one hand, the left hand (the free hand) typically holds a shield or buckler to provide extra defensive capabilities. This was not always the case, however, and in some situations, the left hand could be used for grappling or grabbing the opponent's weapon instead.

As time progressed, armor naturally evolved into a more formidable defense against the then widely used cutting weapons, such as the arming sword. As a result, the arming sword fell out of use as a primary weapon in favor of more powerful thrusting weapons like the hand and a half sword and longsword that were capable of piercing armor outright. The arming sword still found use, however, as a sidearm when wielding these two-handed swords as it remained a versatile cut and thrust weapon. Due to this new direction as a sidearm, the arming sword would eventually evolve into the side-sword during the Renaissance.[2]

[1] Oakeshott, Ewart. *The Sword in the Age of Chivalry*. London: Arms and Armour Press, rev. ed. 1980.
[2] Coe, M. (1989). *Swords and Hilt Weapons*. New York, New York: Weidenfeld and Nicolson. HAM 739.77 Sw 7.

Artifact: “Langes Messer” (infantry saber) Accession number: 2036.3

A later one-handed sword that saw use was the messer. The messer appears primarily in the 14th century but is present up through the 16th century. It bears a close resemblance to the falchion, a sword with a single curved edge and a straight back much like a machete. The hilt of the messer consisted of a straight cross-guard and *Nagel* (a protrusion from the right side of cross-guard that curves downward to protect the wielder’s hands. Messers have “hat-shaped pommels” and generally have overall lengths of about 30 centimeters and weigh around two and a half pounds.

When using a messer in combat, it is crucial to remember the concepts of “before”, “instantly”, and “after”.[3] The concept of “instantly” means that no matter what action you perform, you must perform it instantly. Hesitation leads to defeat, death or shame. The concept of “before” means that you should instantly move into another technique after landing an attack on your opponent. By acting “before” your enemy can retaliate, you take control of the fight and take away the opponent’s ability to counterattack. Finally, the concept of “after” means that if the enemy lands an attack on you, you should instantly move into a technique. Thus, even though you have acted “after” your opponent, you have still taken away his chance to attack again “before” you can retaliate. These basic concepts are central to the art of combat and must be learned first before all else.

[3] Lecküchner, Hans.*Hans Lecküchner's Art of Falchion Combat (1482)*. Transl. Jeffrey L. Forgeng.

The skilled use of a messer in combat does not rely solely on these basics, however. The stance you take and the types of cuts you use are also important. When using the messer without a shield, it's best to take a stance where you place your free hand on your back if you are fighting defensively or on your chest if you wish to use your hand offensively (such as to grapple the opponent or pull the opponent's sword). With stance ready, a swordsman using the messer should know six chief cuts known as the Wrath cut, Waker, Anger cut, Constrainer, Danger cut, and Winker.

The first of the cuts is performed when your opponent strikes from above his right side to your head by cutting from above your own right side at the same time without parrying. This is the Wrath cut. After the cut, you should instantly let your point thrust forward at your opponent's face or chest and then turn your messer against the opponent's so that your sword's long edge stands upwards. This is known as the Wrath thrust. When used together, it is known as the Wrath cut-thrust and is capable of countering all high cuts.

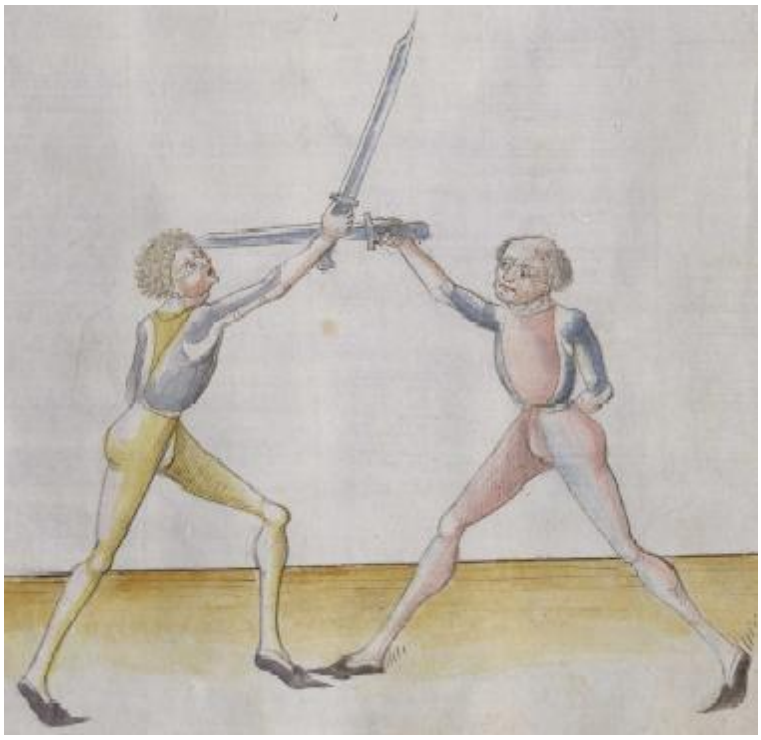
The second of the cuts is performed when he holds his messer before his head on his left side in the guard of Steer. You must set your left foot forward and hold your messer on your right shoulder then spring with your right foot to your right side, striking with the right edge upon your opponent's messer and instantly following up by winding your point at his face. This is the Waker, which is capable of countering the low cuts as well as certain postures and guards such as the Steer and Boar.

The third of the six cuts is executed when your opponent holds his messer with an upstretched arm over his head in the guard of the Watchtower and waits for you to approach. As you near him, set your left foot forward, holding your messer on the ground so that the flat is toward your body on your right side. If your opponent steps towards you to threaten a strike, spring with your foot well to your right and turn the hilt of your messer before your head so that your thumb stands underneath as you move. From there, you should instantly strike with the blunt edge to the target's upper left side. If he

cuts first, though, spring out from the cut with your right foot, parrying well to your right side, and following up with the aforementioned cut with outstretched arm at his head. This is the Anger cut which counters the Watchtower guard and any cuts that are delivered downwards from above. Additionally, the Anger cut is meant to be performed with the forte of your blade, not the foible. This allows you to go up with your forte toward his foible if you are parried so that you can catch his foible with your forte and deliver a strike to his neck.

The Constrainer is the fourth cut and is prepared by setting your left foot forward while holding the messer with its point to the ground so that your thumb is underneath the sword. From here your actions depend on your opponent's moves. If he cuts from above to your head, turn the messer and cut in against his cut using the blunt edge with outstretched arm, reaching over his messer at his face. If the opponent executes a Failer and tries to change through underneath, keep the point long before his face, constraining him from doing anything and preventing him from coming through underneath.

The fifth cut is the Danger and is used for breaking through the guard of the Bastion. When your opponent positions himself in the Bastion guard, set your left foot forward while holding your messer with outstretched arm over your head in the Watchtower guard. Then spring with your right foot, cutting in high with your long edge, keeping your arm up, and sinking your point downwards at his face or chest.



The sixth and final cut is the Winker and is best when used against opponents that parry freely. Begin with your left foot forward while holding the messer on your right shoulder if your opponent uses the Watchtower. Then, cut from your right shoulder with outstretched arm in at him with your long edge, turning your messer against your opponent's while cutting and then strike him on the head with your short edge. From this strike, instantly let your messer sink before your body and then go through on your left side with sunken point to strike him on the head on his right side with your short edge.

The messer eventually began to fall out of use towards the end of the 15th century. As with the arming sword, the production of strong armor called for more powerful two-handed thrusting blades and caused cut and thrust blades like the messer to be set aside. The legacy of the messer does not completely die, however, as later swords like the cutlass and sabre bear striking resemblance to the messer both in sword fighting style and appearance and keep Lecküchner's treatise relevant.

Two-Handed Swords

A longsword, used interchangeably with "hand-and-a-half sword" and "bastard sword," is a type of bladed European weapon used approximately from 1350 to 1550. It is typically constructed with a

cruciform hilt with a two-handed grip attached to a straight double-edged blade. The blade averaged anywhere between 39 to 48 inches.[4]

Combat with the longsword is a parallel for many other forms of combat. The similarities stem from its ability to be fought with using either both hands or one hand. Appropriately, this extends its versatility to encompassing both one handed and two handed technique sets and allows for making both close (fighting close to your opponent) and wide plays (fighting farther away from your opponent). As a result, the longsword is able to counter different weapons such the dagger or spear by utilizing the many different techniques and guards afforded by the two different styles of wielding.[5]

Just like other types of combat, though, a swordsman should understand the division of combat before fighting. When fighting with the longsword (similarly to many other forms of combat), combat is divided into three parts: the beginning, the middle, and the end. The beginning (called "the Onset") is when a swordsman has yet to attack. Planning is a crucial element here as you must both recognize your opponent's guard and then pick an appropriate attack to counter that guard. The middle (called "the Handwork") is where the art of swordplay begins, as here the swordsman must perform various techniques immediately after the Onset in order to outmaneuver and eventually defeat his opponent. The final division, the end (called "the Withdrawal"), is how the swordsman may cut away from the opponent without taking injury while possibly injuring his opponent. Performing the right move during these periods of combat is critical to defeating the opponent.

To be successful during the Onset, a swordsman should know the cuts he can perform and the postures he can take. The postures include the four chief postures (the High Guard, the Ox, the Fool, and the Plow) and the eight secondary postures (Wrath Guard, Break-Window, Longpoint, Crossed Guard,

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[4] Loades, Mike (2010). *Swords and Swordsmen*. Great Britain: Pen & Sword

[5] Fiore de'I Liberi(1400-1410). *The Flower of Battle (Fior di Battaglia)* retrieved November, 11th, 2013 from wiktenauer.com.

Unicorn, Key, Irongate, and Change). With knowledge of the postures, a swordsman can then learn the four chief cuts (called High, Low, Middle, and Wrath) from which the twelve secondary cuts (called Squinting, Crooked, Short, Clashing, Rebound, Blind, Winding, Crown, Wrist, Plunge, Change Cut) are derived. From these cuts, five Master cuts are selected (namely Wrath, Crooked, Thwart, Squinter, and Scalp Cut) chosen for their nature as the core of all other sword techniques.

Following the Onset, the Handwork requires the greatest level of art and skill to truly excel. In this part of combat, there are many maneuvers and movements that require coordination between both sword and body such as using the sword to bind, wind, chase, slice, run off, etc. Additionally, there is a dire need to understand the openings in an opponent's defense and even more dire need to adopt and maintain proper footwork.

The final stage of combat, the Withdrawal, is very useful to many different combinations of cuts, guards, maneuvers and postures. Depending on the organization of these cuts and postures, you will end up executing widely varying Withdrawal stages. [6]

Even with knowledge of the division of combat, a swordsman still needs knowledge of the division of the combatant in general as well. Firstly, the combatant is divided into four quarters: the upper and lower as well as the left and right. The combatant can further be divided in the area around his head into the same four quadrants, with the upper quadrant located around the scalp, the lower around the cheeks and neck, and the left and right on their respective sides of the nose. Knowing this division is important to landing strikes on your opponent, as a combatant will always leave one of these quadrants open to attack and you must know how to strike that weak point.[7]

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[6] Meyer, Joachim. "Contents of the First Book Concerning Combat With the Sword" *The Art of Combat: A German Martial Arts Treatise of 1570.* Transl. Jeffrey L. Forgeng. London: Greenhill Books, 2006.
[7] Meyer, Joachim. "Chapter 1: Concerning the Combatant and His Division" *The Art of Combat: A German Martial Arts Treatise of 1570.* Transl. Jeffrey L. Forgeng. London: Greenhill Books, 2006.

Alongside the division of the combatant, a swordsman should also know the division of the sword. The longsword is divided into five parts: the pommel, point, hilt, grip, and blade. The blade is further divided into the forte and foible. The forte is the section of the blade extending from the hilt to the middle of the sword, while the foible extends from the middle to the point. Within the foible lies the division of the edges between short and long, with the long edge being full and facing straight out towards the wielder's opponent and the short being a half edge facing towards the wielder. While the sword physically consists of five parts, the parts are grouped into four sections for combat. The groups are called the grip (consisting of the hilt, grip, and pommel), the forte (which includes just the forte), the midpart (consisting of equal parts foible and forte), and the foible (which includes just the foible).[8]

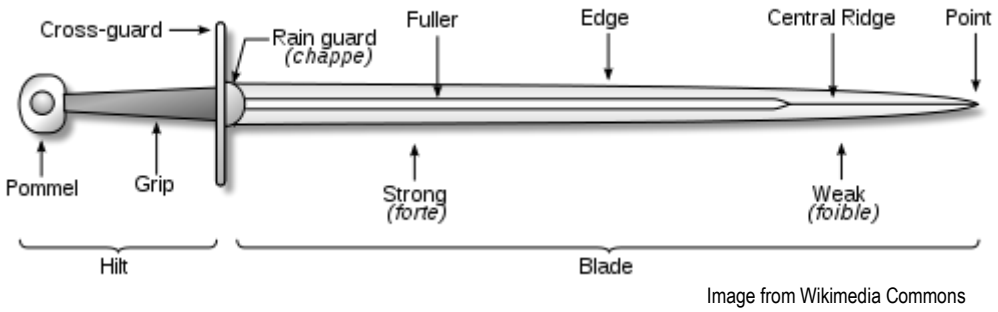

Image from Wikimedia Commons

After learning the divisions, a swordsman should next prepare himself for combat with the knowledge of the postures. As previously mentioned there are 12 different postures to learn and each posture has a specific purpose for offense and defense. At the most basic level, the four chief postures are split between attacking and defending with the Ox and Plow postures focusing on defending and the Day and Fool postures focusing on attacking. The Ox defends the upper part of the combatant on both sides, while the Plow defends the lower part on both sides; also, the Day can deliver attacks from above, and the Fool can deliver attacks from below. Stemming out from these chief postures are the secondary

[8] Meyer, Joachim. "Chapter 2: Concerning the Sword and Its Division" *The Art of Combat: A German Martial Arts Treatise of 1570.* Transl. Jeffrey L. Forgeng. London: Greenhill Books, 2006.

postures (Wrath, Longpoint, Change, Side, Irongate/Crossed, Hanging Point, Key, and Unicorn). The Wrath Guard can utilize the same techniques as the Ox, but with added conduct to deceive the opponent. The Longpoint is so named for holding the sword out with extended arms towards the opponent allowing for wide plays and a greater threat range. The Side Guard is used primarily for guarding your right side, but can be reversed to guard your left side. The Irongate is often mistaken for the Crossed Guard, but in truth it differs in that the wielder's sword points up in the Irongate and down in the Crossed Guard. The Irongate protects much like an iron door, allowing to put off any cuts or thrusts made to your front. The Hanging Point is performed with extended arms, holding the sword in front but slightly hanging downwards, allowing for defense against upper region attacks. The Key is a posture meant to guard your right side by exposing your left, but in such a way as to allow for strikes to your opponent's face. Finally the Unicorn is a posture leaving the tip pointing upwards into the air, allowing for downward strokes from above. From these postures, a swordsman can deliver many different types of strikes and cuts.[9] With this information, a would-be swordsman should have enough knowledge to begin learning how to perform the cuts and handwork to truly excel in blade combat.

From around the end of the 15th century onwards, the longsword's days as a military weapon were numbered. The longsword was mostly obsolete by the 16th century, with its last real military use resting with the Zweihanders wielded by the German Landsknechte during the early 1500s. By 1520, the Swiss sabre was replacing the straight longsword in the battlefields, and by 1550 the longsword had fallen out of use from Switzerland. While the longsword remained relevant into the 1560s in Germany, it still declined in the latter half of the 16th century.[10]

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[9] Meyer, Joachim. "Chapter 3: Concerning the Postures or Guards" *The Art of Combat: A German Martial Arts Treatise of 1570.* Transl. Jeffrey L. Forgeng. London: Greenhill Books, 2006.
[10] Oakeshott, Ewart. *The Sword in the Age of Chivalry*. Boydell Press 1994. Page 56.

Artifact List:

Two-Handed Sword

Accession: 2743

Two-Handed Sword

Accession: 666

Two-Handed Sword

Accession: 2484

Two-Handed Sword

Accession: 3462

Two-Handed Sword

Accession: 635

Two-Handed Sword

Accession: 667

Two-Handed Sword

Accession: 2009.01

Longsword (“hand-and-a-half” sword)

Accession: 1996.01.2

Rapier and Small Sword

The rapier is a specialized thrusting sword developed in the 1540's for urban self-defense and single duels, rather than open warfare on a battlefield. The cumbersome cut-and-thrust war swords were simply too unwieldy for a cramped urban setting, and so the civilian needed the lightness and reach of the rapier in order to effectively defend himself in the city. Since this was for unarmored civilian combat, the sword could sacrifice the armor piercing power granted from a heavier blade for agility while remaining a useful urban weapon. The rapier continued to evolve for the next forty years or so until around 1580 when it reached its final form. The rapier generally stayed under three pounds, but had such a wide range of experimental blade lengths that makes it difficult to provide a meaningful estimate. [11]

The small sword, being an evolution and extension of the rapier, bears many similarities to its predecessor. Like the rapier, the small sword was a thrusting sword, primarily used for duels. In fact, the small sword saw use in duels up until the middle of the 20th century. The small sword was also used by 18th century gentlemen as a symbol of their nobility. Unlike the rapier, however, the small sword was used in the military. Primarily though, the swords were used much the same way as the 18th century gentlemen as symbols of rank and hardly ever were used on a battlefield since the focus of combat was often in firearms. The small sword's blade typically ranged from about 24 to 33 inches that tapers to a sharp point. [12]

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[11] Clements, John. "ARMA Director John Clements Answers Email on Swords and Swordsmanship: Questions and Answers About the Rapier ." *Questions and Answers About the Rapier*. N.p., n.d. Web. 18 Nov. 2013. <http://www.thearma.org/Youth/rapieroutline.htm>.

[12] *Infantry Drill Regulations, U.S. Army*. New York: Military Publishing Co. 1911 With Text Corrections to February 12, 1917, changes No. 18.. New York: Military Publishing Co. 1911 With Text Corrections to February 12, 1917, changes No. 18.

Since the rapier and small sword are so similar in their fighting styles, and because there is far more material concerning the rapier, I will only delve into literature depicting fighting with the rapier. According to the rapier master Giacomo DiGrassi's treatise, *His True Arte of Defense*, in order to fight well with any weapon, a combatant needs two things: Judgment and Force. Judgment is described as knowing the manner and timing to handle his weapon of choice, and Force described as the power to execute what his Judgment has deemed necessary. In order to act upon Judgment (using the Force), however, the combatant must be both strong enough to perform attacks in the proper manner and fast enough to carry them out with the proper timing. Clearly, though, before he can act with Force, a combatant must first obtain Judgment.

On obtaining Judgment, it should first be noted that it is essentially man's knowledge of how to avoid danger. In this sense, obtaining Judgment revolves around using five rules of combat to your advantage. These rules are that the straightest line is the shortest, the closer combatant strikes sooner, a circular strike will be stronger at the end of its circumference than in the center, a small force is easier to withstand than a large force, and every motion has its own time to complete. By these simple rules, a combatant is able to judge any opponent's actions accurately as well as his own actions. For in the art of combat, there is only striking with advantage and defending with safety; and having knowledge of the five rules empowers these two elements greatly. [13]

With Judgment in mind, a combatant must know at least the nature of his weapon (in this text, the rapier, which is used interchangeably with the sword here). A rapier has only two edges and point, therefore, a combatant can only attack and defend with these three components. Also, any edge attacks will trace a circle or part of a circle, with the hand being the center and the length of the blade the radius. This circle divides the sword into four parts, numbered one through four. The first part consists

[13] DiGrassi, Giacomo(1599). "The True Art of Defense". *His True Arte of Defense*. Retrieved Nov. 19, 2013 from http://www.cs.unc.edu/~hudson/digrassi/trueart.html

of the pommel, grip, hilt, a small portion of the sword. This part, along with the second part (which consists of the greater half of the forte) are used primarily to guard from attacks since they are closest to the center and therefore do not provide strong attacks. Thus, from the midpoint to the point are parts three and four, which provide the strongest attacks of the sword. Of the four though, the fourth part has the strongest offense. Additionally, the arm is also divided by strength, with attacks made from the wrist being weak, and attacks made from the elbow and shoulder being strong. Attacks made with the shoulder are very slow, however, and are not recommended.

It is also important to note the mechanics of striking with a sword. Knowing the division of the arm, if a combatant traces all three circles of rotation in the arm in the same direction (either upwards or downwards), then he shall attack either upwards or downwards with a cut. If he traces the wrist's circle of rotation in the opposite direction of the rest of the arm, he shall attack straight in a thrust. A combatant should his opponent with his right shoulder rather than his chest, so that he may more easily bend his body to avoid cuts and thrusts.

When positioned correctly, it is then important to use proper footwork. A combatant must either step straight or step circularly and must always move either forward or backward. By alternating between stepping straight and stepping circularly, a combatant can perform what is known as a triangle step, which allows him to stay guarded even while moving.[14] The right leg should always be the strong foot of the right hand, and the left leg should be the strong foot of the left hand in order to create a balanced, fluid attack and keep the man from falling. A combatant also creates a strong guard by doing this, allowing the sword to withstand stronger attacks. Additionally, the hand and foot should move as one, and one foot should always remain on the ground.

[14] DiGrassi, Giacomo(1599). "Of The Sword". *His True Arte of Defense*. Retrieved Nov. 20, 2013 from http://www.cs.unc.edu/~hudson/digrassi/trueart.html

A combatant with good footwork still needs to know the guards in order to minimize injury as much as possible. Three basic guards with the rapier are the high guard, the broad guard, and the low guard. The high guard is positioned with the combatant's sword held high above his head pointing at his opponent's head. This guard allows the combatant to perform an overhand thrust at the opponent's head. The broad guard calls for the arm to be bent at the elbow with the sword being held around the upper torso with the blade pointed inward toward the opponent's chest. The low guard is held with a straight arm by the waist, with the point facing upwards towards the opponent's chest. In any of these guards, it is important for a combatant to remember to keep the point of his blade towards his opponent's head or chest, in order to maintain the threat of damage to those areas and to protect from harm. It is almost always better to strike from these guards with a thrust rather than a cut, since a thrust strikes in a straight line and therefore has the least distance to travel. In certain cases, however, it may take longer to thrust (due to positioning) than to cut and in these cases, a cut is the better choice. When a combatant does thrust, he should keep his left foot somewhat behind for the beginning of the thrust then move the back foot forward a half pace to strengthen the thrust.[15]

The rapier is a unique sword as it has persisted as being commonly used even in the modern era. In present time, however, fencing with the rapier has become a sport rather than a gentleman's way to settle honor. It has also evolved considerably from its initial predecessors into an even lighter, thinner sword with a dull point. This is because the sword has fallen out of use for anything but sport, and as such it no longer requires the killing edge and point it once required to settle duels.

[15] DiGrassi, Giacomo(1599). "Of Paces; Of Wardes". *His True Arte of Defense*. Retrieved Nov. 20, 2013 from http://www.cs.unc.edu/~hudson/digrassi/paces.html

Artifact List:

Cup-hilted rapier after the style of 1650-1700

Accession Number: 1802.2

Rapier

Accession Number: 1374

Bilbo-hilted Rapier

Accession Number: 1803.1

Dish-hilt Rapier

Accession Number: 1786.2

“Crab-claw” hilted Rapier

Accession Number 3060

Non-European Martial Sword Arts

One of the most commonly recognized non-European sword art throughout the globe is kenjutsu. Kenjutsu, though it translates literally into “technique of the sword”, does not refer to a particular way of using swords. Kenjutsu is actually an umbrella term that encompasses a wide variety of different schools of swordsmanship (known as koryū). Because of this, the specific actions and training performed when practicing kenjutsu vary widely from school to school. It is common in most kenjutsu schools though for practitioners to perform techniques that could be used in warfare on their own, and kata (literally “form”, they are essentially practiced patterns of movements that can either include or exclude full contact body strikes) with an opponent. This training was carried out using the solid wooden bokutō (literally “wood sword”), which resembled the katana heavily in both size and shape. Due to this similarity, the techniques practiced with the bokutō carried over fairly well to the katana the primary weapon used in most schools of kenjutsu.[16]

Since there are many different disciplines of kenjutsu, I will focus on describing some of the intricacies of only one school, namely the Kashima Shin-ryū school. Like many other schools of kenjutsu, the Kashima Shin-ryū school held a strong focus on attaining spiritual enlightenment through training. This was reflected in the term michi (literally “path”) in that there were many paths for one to take, but only true paths lead to enlightenment. This was originally implemented into kenjutsu (and other martal arts as well) around the Sengoku era, a period of war in Japan, where those who fought using martial arts like kenjutsu must battle not only their foes, but their fears of death and injury as well. Achieving this spiritual peace was often a way for men to set aside their fears and fight without hesitation, and so it became part of the Kashima Shin-ryū school when traditional kenjutsu schools began forming towards the middle of the Sengoku era. It’s unsurprising then to find that this particular school stems from the

[16] Ozawa, Hiroshi (1997). *Kendo The definitive guide*. United Kingdom: Kodansha Europe.

Kashima Grand Shrine, one of the oldest religious institutions in Japan that honors Takemikazuchi-no-Mikoto, the patron deity of warriors and the warrior arts.

From an exorcising ritual called Harai-tachi based off of the swordplay of Takemikazuchi, a legendary shrine attendant known as Kuninazu-no-Mahito discovered a sword art that was called Kashima-no-tachi (literally "the sword of Kashima"). The Harai-tachi begins with a sword being drawn horizontally from the scabbard and then swept upward in a diagonal cut from right to left (kasumi-giri); the blade is then turned and brought downward, in another diagonal cut from left to right this time (kesagiri); to finish, the sword is raised slowly along the same right-to-left diagonal as the first cut and then drawn horizontally at about shoulder level, from left to right, before being returned to the scabbard. The diagonal cuts represent Takemikazuchi's castigation of rebelling deities, and the horizontal drawing motion represents his forgiveness of the gods. From this, Kuninazu developed a series of techniques called shinmyō-ken (literally "sword of the divine mystery") or nukinuchi ("extricating strike") that focus on achieving a "silent victory", where a swordsman defeats an opponent without touching the opponent's weapon with his own. This would involve making an opening attack-either a cut or thrust-that the opponent attempts to turn aside. The instant before the opponent's weapon contacts the swordsman's, the swordsman changes the direction of the attack, spinning the weapon around the block and striking down the opponent all in one motion. These maneuvers were later incorporated into the official Kashima- Shin-ryū school when it was formed by Matsumoto Bizen-no-kami Ki no Masamoto.[17]

Matsumoto was an accomplished samurai in battle and sought to form a new style of swordsmanship, and together with Kunii Kagetsugu, a warrior from Shirakawa who had developed a

[17] Friday, K. F., & Seki, F. (1997). "The Kashima Grand Shrine and Takemikazuchi-no-Mikoto" under "Heritage and Tradition" in *Legacies of the sword the Kashima-Shinryū and samurai martial culture*. Honolulu, Hawaii: University of Hawai'i Press.

new style called Kashima-Shintōryū, created the Kashima- Shin-ryū school. The core of Kashima- Shin-ryū's techniques was the concept of ichi-no-tachi, which basically translates to the most advantageously positioned sword stroke. Performing ichi-no-tachi called for the swordsman to enter his opponent's striking range, drawing an attack, but making no attempt to block or divert it. Instead, the swordsman steps through inside and past the blow, in order to deliver a decisive strike of his own. It is a risky technique that is crucially dependent on timing, positioning of the swordsman's steps, and the angle of the swordsman's strikes, however when performed successfully it is nearly impossible to counter. This reflects what is known as katsujin-ken (literally "life-giving sword"), which is a concept in martial art theory that centers on drawing the opponent out and inducing him to strike, then going inside the attack and countering it at the point of origin or the farthest point of extension.[18]

Ichi-no-tachi is only one of many ideas in the school, however, and alongside this are many different techniques such as enbi-ken (literally "flying swallow sword", a counterstrike that dips and slides around an opponent's attack like a swallow in flight), chūkoroshi (literally "intermediate killing", where a swordsman modifies his attacks to incapacitate rather than kill), and inazuma (literally "thunderbolt", quick counterstrikes applied against nerve centers at the precise instant the opponent reaches the focal point of his attack). These techniques and more are learned and mastered through practicing kata (generally translated as "form" or "forms") which are most accurately described as a sort of "pattern practice". Students practice their kata in pairs, with one student designated as an attacker named either the uchitachi (for when he is armed with a sword), the uchite (when he uses a weapon other than the sword), or the ukete (when he is unarmed). The defender is named either the shitachi (when he is training with sword) or the shite (when training unarmed or with another weapon). Through kata, students learn and master their school's techniques and attacks regardless of generation, as the

[18] Friday, K. F., & Seki, F. (1997). "The Three Founders" under "Heritage and Tradition" in *Legacies of the sword the Kashima-Shinryū and samurai martial culture*. Honolulu, Hawaii: University of Hawai'i Press.

core of the kata were considered to remain constant even as the outward form of the kata changed. For the Kashima- Shinryū school, and indeed all other traditional kenjutsu schools, kata is the most efficient and most widely used way of imparting the school's knowledge from master to student. This is because within the kata lie all the postures, techniques, strategies, and philosophy that comprise a school's very essence, and since kata is usually fixed by tradition, it provides a systematized way of imparting this knowledge. This is not the true function of kata, however. In truth, a school's teachings cannot be simply read in a book or learned from a lecture, they must be experienced first-hand, and this is what the entire premise of kata is.

Within the kata, lies three main components of the school's essential knowledge: hyōhō (literally "strategy"), te-no-uchi (literally "application of skill"), and waza (literally "tactics"). Hyōhō refers to the essential principles of martial art, meaning that it designates the general principles around which a school's approach to combat is constructed. This includes things like the reasons to choose offensive or defensive tactics, the angles of approach to an opponent, the striking angles and distances for various weapons, the proper state of mind to have in combat, the goals of combat, etc. Te-no-uchi is just the fundamental skills required in order to properly use hyōhō. These skills include concepts like timing, posture, the concentration and generation of power, etc. Finally, waza are the applications of hyōhō and te-no-uchi in specific situations; the tactics in and through which a student is trained. These three ideas are inseparable, as hyōhō manifests in waza through te-no-uchi. In this sense, kata can be viewed as compendiums of waza and manifestations of all three components. It is clear then, that through kata students first learn the waza, then master te-no-uchi and finish by mastering hyōhō.

In modern times, the Kashima- Shinryū school continues onwards, led by the soke (literally "headmaster") Kunii Masakatsu. It is split into twelve disciplines and two main arts: the omote arts and the ura arts. While the omote arts focus on training in edged weapon arts (such as kenjutsu), the ura arts focus on unarmed and staff weapon arts (such as bōjutsu). Its kenjutsu kata and spirituality both

remain largely intact. Additionally, in terms of kenjusu in general, it is said that out of the kata sparring the modern sport of kendo emerged and evolved.

Staff, Dagger, and Wrestling

By: Brad Davison

Introduction

Importance and Acceptance

As said by the great Renaissance courtier Castiglione: "It is very important to know how to wrestle, for it is a great help in using all sorts of weapons on foot."[19] Wrestling techniques helped teach basic movements and principles that could be translated into armed combat or used when grappling. Wrestling was taught for both sport and combat throughout the medieval ages, albeit with very little development in style.[20] However wrestling was not always viewed as noble and vital to a warrior's training, after the medieval ages some masters saw it as unnecessary and others still called it barbaric.

FIGURE 10: WRESTLING (KAL (MUNICH) WRESTLING)

Base for All Weapons

Wrestling can be considered the base for all weapons for several reasons. Firstly, as most masters teach, wrestling requires several basic skills to master, such as strength, speed, balance, and knowledge of the skill. These skills are fundamental to all types of fighting and are also found in

[19] Castiglione, Baldassare. *The Book of the Courtier*.
[20] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 186

Japanese[21] and Filipino wrestling. Secondly, the primary wrestling guard stances as described by the 14th century fencing master, Fiore, (long position, boar's tooth, iron gate, and frontal position) are nearly identical and used in the same way as four of his sword guard stances that go by the same names.[22] This shows a direct relation between the skills learned in wrestling and those used for sword fighting. Thirdly, fights with any weapon would very often end with both combatants grappling with each other, and any warrior without wrestling experience would be at a deadly disadvantage.

FIGURE 11: SWORD FIGHT ENDING WITH

Common Styles

> "Specifically with regards to wrestling, Monte considers that a well-tempered athlete will have the ability to refrain from impetuous attacks; to move with appropriate speed and just measure; to anticipate and counter his opponent's movements; to understand where he himself is most vulnerable and, conversely, where his adversary may be most easily injured."[23]

Though there are many different stances that change between masters or throughout a fight the footwork remains constant; short light steps should be taken on the balls of the feet which should be pointed slightly outwards.[24] Before the fight has even begun one should observe one's

FIGURE 12: WRESTLING GRIP (MAIR00533-BSB00006570_00534)

[21] Friday, Karl F. *Legacies of the Sword: the Kashima-Shinryu and Samurai Martial Culture*. 62
[22] Mondschein, Ken. *The Knightly Art of Battle*.
[23] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 197
[24] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 197

opponent to attempt to determine his strengths and skill level. This determines how to best counter your opponent. The 15th century wresting master, Ott, advises:

> "In a fight against a weaker man it is advantageous to attack first when your speed will prove decisive. If he is your equal, you must start action the moment that he does, and seek to make him lose his balance; but, if he is stronger, you must allow him to make the first move and go for the back of his knees or hamstrings."[25]

Ott also advised that a smaller man should attempt to stay within a larger man's guard while the larger man should try to keep the smaller man at arm's length where he has the advantage.[26] Similarly, terrain is an important consideration when loose or slick ground can cause a skilled wrestler to fall while executing a technique whereas your opponent, attacking with brute force, needs only to plant his feet.[27]

Grappling

FIGURE 13: GRAPPLING ARM-BAR

Grappling, not to be confused with wrestling which is a stand-alone martial art, occurs during a fight with weapons when one or both combatants grabs the other. As Agrippa said of grappling: "this is the logical thing to do because of what I have said many times: it is bad to parry if you are not forced to,"[28] meaning that, grappling was preferable to parrying if possible, since a parry just knocks the opponent's blade away but grappling can control the opponent's arm or whole body to keep the blade at a safe distance while creating an opening for yourself. Grappling can be as simple as grabbing your opponent's blade or wrist to stop his motion while you

[25] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 181-182
[26] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 199
[27] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 199
[28] Agrippa, Camillo, and Ken Mondschein. *Fencing: a Renaissance treatise*. 91

attack, or it could be a wrestling move such as a throw or trip. The masters often included a set of specialized grappling techniques for each specific weapon that utilized that weapon in a wrestling move, an example being using a sword to aid in an arm bar.[29]

Use in Combat vs. Sport

FIGURE 14: WRESTLING DURING COMBAT (GLADIATORIA (YALE) 6)

Wrestling was very versatile and had many uses both on and off the battlefield and in addition to its main purpose in life and death struggles it could also be used in sporting events or even simply bar brawls. In these, wrestling was usually done without armor. Another major difference between the three was the intensity of the attack, with combat and street fights usually going to the death, the rules of the sporting arena did not apply. Most masters taught this all-in style of fighting that included dislocations, bone breaks, eye gouges, testicle grabs, etc. Wrestling as a sport on the other hand was much safer and was used for exercise and entertainment. On some occasions nobles would even wrestle to liven up state occasions.[30]

[29] Mondschein, Ken. *The Knightly Art of Battle*. 65
[30] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 175

Similarities to Jujutsu

Jujutsu, meaning “gentle technique,” focuses on turning the opponent’s force against him and is a very effective means of self-defense. This style was used by samurai to defend against attacks by an armed opponent in the case were one’s own weapon is not available. As the opponent in this case could also be armored, striking attacks would not be effective; therefore the majority of techniques were throws, locks, and chokes.

Similarities to Filipino Wrestling

The Filipino martial arts are very practical and versatile, being able to turn almost any found object into a “force multiplier.” Therefore the focus of training was mainly on weapons. That said, empty handed techniques are still a very important part of training. Nowadays people can train solely in Filipino wrestling for the purpose of sport, but in the past they were taught together as one is an extension of the other. The majority of the empty handed techniques focus on self-defense against these found weapons.

Self-Defense - Unarmed vs. Dagger

Necessity

The medieval ages were a dangerous time. The law at the time was an eye for an eye and vendettas were common.[31] Even the nobles weren't safe since "Assassination was considered a viable diplomatic tool."[32] Nobles, knights, and peasants, everyone needed to know how to defend themselves against a knife.

FIGURE 15: KNIFE ATTACK (MAROZZO PRESA NONA)

Techniques

Self-defense is widely taught in depth by nearly early all masters and they all use very similar techniques. They all, of course, start with blocking the dagger, most often by grabbing the attacker's wrist. From here there are several directions to go. According to Fiore: "daggers must be taken away, arms must be broken, and the key is to lock the attacker into a wrestling hold and then throw him to the ground,"[33] meaning once the attack has been stopped, "it is best to quickly destroy the enemy's ability to attack and put him on the ground"[34] It is, however, very important to note the distinction between

FIGURE 16: GRAB THE WRIST AND THROW (FIORE (GETTY) DAGGER)

[31] Mondschein, Ken. *The Knightly Art of Battle*. 30
[32] Mondschein, Ken. *The Knightly Art of Battle*. 30
[33] Mondschein, Ken. *The Knightly Art of Battle*. 35
[34] Mondschein, Ken. *The Knightly Art of Battle*. 34

pulling an attacker down and throwing him. One should never follow an opponent to the ground because he could easily draw a second dagger without your notice and you leave yourself open to a second attacker, which can often be the case if attacked by a group or even in the midst of war. [35]

Improvised Weapons

FIGURE 17: IMPROVISED WEAPON: SCYTHE (MAIR00411-BSB00006570_00412)

Though it is best to have a real weapon at your side when you are attacked, that is not always the case. In that instance it is better to have an improvised weapon than nothing at all. Fiore describes a situation in which a prominent man is attacked while sitting and uses his bastoncello (a short baton used as a traditional symbol of authority) to defend himself.[36] He also teaches how to use a walking stick/broken spear, sticks, as well as tying a salt shaker filled with blinding powder to the end of a staff.[37] This may have been unchivalrous, but as a master, Fiore's first concern was the life of his students.

[35] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 200
[36] Mondschein, Ken. *The Knightly Art of Battle*. 32
[37] Mondschein, Ken. *The Knightly Art of Battle*. 116-123

Dagger

The Weapon

Daggers originated from ancient tools and have been in use since the Stone Age as tools, weapons, and symbols of power. Most daggers consist of a one-handed handle and short flat blade with one or usually two sharpened edges (though some, such as the stiletto, have no edge at all) that end in a point. Some also have quillons, pommels, fullers, and/or ricasso depending on their design.

Common Techniques

FIGURE 18: DAGGER FIGHTING (MEYER_DAGGER_F)

There are relatively few purely dagger techniques since dagger fights break down into grappling so frequently and quickly. This is caused by the facts that the dagger's range of attack is so close to grappling distance that the first attack in most techniques is blocked by grabbing the attacker's wrist with bare hands, and that fighting with a dagger leaves one hand free to do so. After the wrist is grabbed the following steps are very similar to self-defense against daggers except you now have your own means to attack when you have created an opening.

Japanese Daggers

The Tanto is the name for the most common Japanese knife. As opposed to the katana, Tanto were mostly used for stabbing, although they did have one or sometimes two sharpened edges for slashing. The Yoroi Toshi was a Tanto with an extra thick blade and, like a rondel or stiletto (though still having a sharpened blade), was used for piercing armor as well as being able to be used as a Tanto. Less used for combat, the Kaiken were smaller than the Tanto and were carried mainly by women for self-defense.

FIGURE 19: TANTO (BMFA 13.1171)

Filipino Daggers

Filipino daggers have very unique shapes. From the single edged, leaf shaped Barong, to the Karambit with rear facing, curved blade with a finger ring, to the double edged Kalis, famous for its wavy blade. In addition, in Filipino martial arts, any found object could be used as a weapon. Therefore knives, machetes, and sticks could all be used in the same way as a "force multiplier."

Staff Weapons

Historical Impediments

"With some notable exceptions, [the master's] written treatments of fighting with staff weapons tend to be both brief and imprecise and generally convey an impression that the material has been included more for completeness's sake than from conviction."[38] Even Agrippa, who is known for his in-depth geometric teachings, barely mentions staff weapons. The terminology they used was inconsistent and unreliable within their own writings and more so from master to master. However even with all the inconsistencies it is still clear that "despite changes in the configuration and size of the blades, there was little change (let alone evolution) in the handling of staff weapons for personal combat."[39] There was some military advancement such as mass formations and the use of halberds by foot soldiers but this was mainly left to the military specialists; the masters were only interested in one-on-one combat.[40]

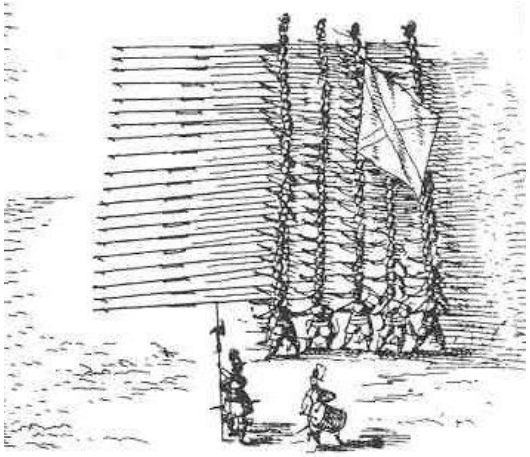

FIGURE 20: PIKE FORMATION (PIKE CHARGING)

[38] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 148
[39] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 150
[40] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 150

Common Techniques

"The key to Fiore's art is a mastery of timing, distance, and opposing the enemy's strength most efficiently. A skilled longsword fencer frequently steps off the line of the attack to parry of counterattack. The same is true with the spear."[41] Likewise "the sword positions (guards) also serve for the poleaxe."[42] Due to the many similarities between staff weapons and swords many masters overlooked what made them different. For example, it should be noted that, with the exception of the quarterstaff, the staff weapons were all balanced more towards their heads than swords. This gives them a lot of power in the swing but they

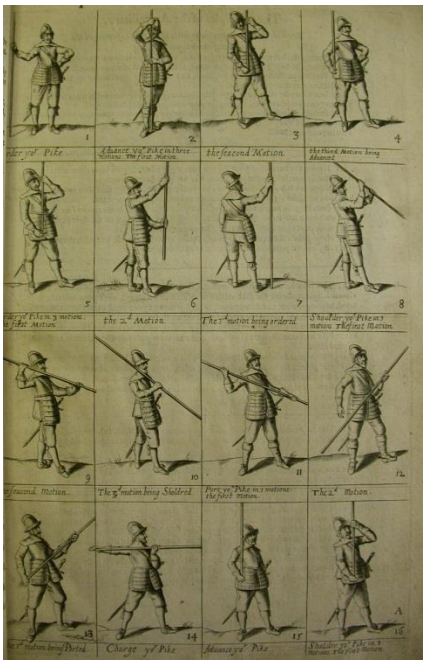

FIGURE 21: PIKE POSTURES (HEXHAM PIKE POSTURES)

> "move comparatively slowly so that feints, especially when attempted with edge strokes, are easily seen and countered. Therefore, 'the best false that may be practiced in the handling of these weapons, is the false of the thrust', and cuts ought never or seldom to be used, 'except great necessitie constrain'."[43]

Many staff weapons also had the ability to hook and grab the opponent. In addition to being useful to knights in combat this was extremely important to the military strength of the footmen, as they were now able to unhorse a mounted attacker. This caused a military revolution resulting in groups of footmen becoming "more economical and often more effective than concentrating solely on an army of mounted knights. Medieval men-at-arms, being pragmatic warriors at heart, were quick to adapt to these new realities and began to utilize new weapons and techniques."[44]

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[41] Mondschein, Ken. *The Knightly Art of Battle*. 94
[42] Mondschein, Ken. *The Knightly Art of Battle*. 88
[43] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 164-165
[44] Mondschein, Ken. *The Knightly Art of Battle*. 82

Classification of Staff Weapons

There are many different types of hafted weapons with every possible combination of blades, spikes, hooks, and hammers each used in a slightly different way, but most of the masters fail to differentiate between them. Instead many teach just one saying the technique is common to all staff weapons. However, one writer, named George Silver, divided staff weapons into three categories: weapons of weight, of perfect length, and above perfect length.[45]

Weapons of Weight

This group includes the battle-axe, halberd, and black-bill.[46] Weapons of weight are heavier weapons that have no fixed length, but are typically five to six feet and "may not well be used much longer, because of their weights."[47] Also, because these weapons are meant to be used in close combat they do not need to be any longer.

FIGURE 22: HALBERD (MAIR00398-

[45] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 165
[46] Silver, George, Gentleman. *Paradoxes of Defence*.
[47] Silver, George, Gentleman. *Paradoxes of Defence*.

Weapons of Perfect Length

Weapons of perfect length are the partisan, glaive, quarter staff, half pike, and forest bill/Welch hook.[48] Perfect length was the height of a raised hand plus the distance between hands when holding the weapon. This usually comes to about eight or nine feet but "a foot of the staff being behind the backmost hand does no harm."[49]

FIGURE 23: QUARTER STAFF (MAIR00322-BSB00006570_00323)

Weapons Above Perfect Length

The long staff, pike and javelin are weapons above perfect length.[50] These weapons have no defined length but from surviving artifacts we know it could be anywhere from sixteen to twenty-two feet, although most pikes were about eighteen feet on average.[51]

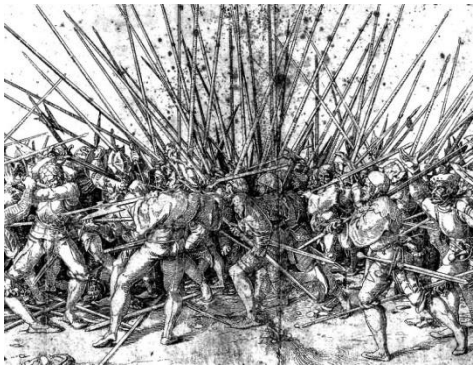

FIGURE 24: PIKE (PIKE PUSH)

Filipino Staff Weapons

The sibat a tool for hunting or fishing used in the Philippines that doubles as a weapon. They look like typical harpoons and have either a barbed metal tip or are simply sharpened to a point. As

[48] Silver, George, Gentleman. *Paradoxes of Defence*.
[49] Silver, George, Gentleman. *Paradoxes of Defence*.
[50] Silver, George, Gentleman. *Paradoxes of Defence*.
[51] Anglo, Sydney. *The Martial Arts of Renaissance Europe*. 166

these are harpoons they could easily be thrown at an opponent or they could have been use as a spear in hand-to-hand combat.

Japanese Staff Weapons

Though the Japanese had many types of staff weapons, they still couldn't match the variety of the Europeans. The Japanese samurai, footmen, and warrior monks could all choose between the yari, naginata, bo, and jo. Sojutsu, the Japanese spear technique,taught the use of the yari, a straight edged trusting weapon. Naginatajutsu used a curved blade, shaped similarly to a katana, mounted on a staff and used primarily for cutting. The naginata is often compared to the European glaive. Bojutsu and jojutsu uses plain wooden staffs of varying lengths just like the European quarterstaff.

Conclusion

The end result of our project was to produce a DVD accessory to the collection of the Higgins Armory Museum as it moves to its new home in the Worcester Art Museum. This DVD will assist instructors and students alike in continuing the work of the Higgins Sword Guild on medieval martial arts. We are satisfied with the outcome of our project, and feel it will be a benefit for many future generations of practitioners.

The team selection process was at the discretion of the advisor, Jeffrey Forgeng. Three team members applied together, with a fourth team member was added to round out the group. Each member brought a wide variety skills to the team, and together were able to accomplish all goals of the project. The work was divided according to these skills, ranging from management, AV maintenance, video editing, script writing, animations creating, and narration.

The project was performed over an entire academic year, with each term of the project having different goals for the overall completion of the project. The first term of the project consisted of the PQP, a term for preliminary study and group acclimation. It was during this term that the team was formally introduced, met for the first time, and got to know the museum and the professor. After getting a foundation for the project, the team worked on planning for the next three terms. Weekly meetings had the team scheduling following terms week by week, as well as gathering source lists to prepare for upcoming research. This term also saw the team assessing previous IQP work to get a better understanding of where to begin and where to go. The previous IQP teams had a plethora of footage, stills, research, and other resources for the team to utilize throughout the entire year. However, at first the proposal outlined a process which would use the previous teams' footage to make an introductory DVD, replacing weaker sections to strengthen the overall video. The team felt that using different footage, with different resolutions, filming procedures, etc. would lead to a lower quality video.

Therefore the team decided to re-film all necessary sections to ensure that the video was uniform throughout. This is a possible point of improvement for future IQPs and the team submitted a list of improvements and suggestions for future projects. Regardless of the re-filming, the team used the previous IQPs extensively to get a better understanding of techniques and backgrounds throughout the project.

The first formal term of IQP consisted of background research into the history, basic principles, and weapons of the martial practices. These papers will accompany the project and provide the necessary foundation to the assignment. Each research paper had four separate sections, ranging from time periods in history, to relations between European weapons and their foreign counterparts. The source lists developed during the PQP provided groundwork for the research and were constantly updated during the term. This term also saw the creation of a mock interview and sample video, which provided invaluable experience with editing and filming that would prove vital during the final term. It is highly suggested to continue this practice with any teams that lack knowledge in these areas. Overall this term went the smoothest of all, as the research was done individually with minimal possibilities of errors. However, the team noted that large sections of the research did not find their way into the DVD, and found that certain sections which constituted a large portion of the research was not necessary in the final product. For example, the research into other cultures' techniques provided a nice background, but could have been limited to one section in each member's research, instead of being half of three fourths of it.

The next term consisted entirely of filming and script writing. Each week the team spent time with professor Forgeng replicating the practices from the manuscripts. A "black-book" reference was provided by the professor which displayed all of the necessary concepts to display in the video, in addition to having the professor on hand to add input. During this term, video and audio recording equipment was borrowed from the ATC at WPI. The Higgins Armory great hall was the site for all of the

filming, chosen for the medieval aesthetic it could provide. This choice turned out to be both a curse and a blessing, as the aesthetic added an excellent atmosphere to the video, however the Armory's closing caused some areas to be inaccessible at times and caused the video to look less uniform over all. The team encourages future IQPs to use any opportunities for proper aesthetics, but stresses planning ahead in case certain areas are inaccessible or altered. Additionally, the team noted that scheduling this term was not as adequate as it could have been. It is suggested that a stricter stance on coming up with a specific schedule for filming and script writing be implemented to keep all group members on the same page.

The final term's responsibilities included finishing filming, editing, finalizing the video footage, and completing the full project paper. The editing software used was Adobe Premiere Pro, with generic sound clips and music being taken from free sources on the internet or generated. Continued weekly meetings provided updates to timetables. This term proved to be the most stressful, as the team had hoped to be done editing early on. The end video was well polished resulting in an excellent final product, but the video editing took much longer than previously expected. The team firmly believes that the higher production quality justifies the extra time spent, but also believe that they could have done a better job maintaining the schedule each week. The team sees two possible solutions to this problem. The first is stressing better team communication. Members were often unclear on how little they provided to the overall project or where other members were at in their work and where they should be. The second is enacting a better update policy with the professor. They suggest explicitly discussing what each member did each week to help facilitate better work from the team.

The final video will prove to be a useful support for future instructors wishing to enhance their classes. The team intended from the beginning to create something that was more than just an information overload. The intent was to keep the video entertaining and informative, and thus it went through many iterations to achieve balance. The team attempted to maintain this balance throughout,

but the final product leans more on the informative side, mainly because of feasibility concerns. Another aspect that went well, however, was the turn-around time of learning new material. The team was able to interpret and present the techniques adequately for each week's filming over a short period of seven weeks, techniques that are lifelong studies for some scholars. The audio and visual editing was extensive, with the team stressing to maintain a professional level of work.

This project provided a vast amount of knowledge and experience for the team. Each member gained extensive familiarity with editing, filming, and, of course, the martial practices studied. The team sees great promise in acquiring the experiences, and feels that future IQPs should all work with similar concepts. Furthermore, with the transition of the collection of arms and armor finally complete, future IQPs should work to fully integrate a successor to the Higgins Sword Guild at the Worcester Art Museum. This video provided a wide introduction to many concepts, and future videos would do well to dig deeper into the specifics of each. Although these practices do not find practicality in modern combat, the fact that the field is growing at exponential rates should prove the viability of organizing classes to study it. These studies are a valuable field of academia, provide a memorable and unique experience for enthusiasts and scholars alike, and connect us all to a past we have forgotten.

Team Bios

FROM LEFT TO RIGHT, ANDREW AVEYARD, BRAD DAVISON, PROFESSOR JEFFREY FORGENG, JASON CARDWELL, AND DANIEL HAGGERTY.

Brad Davison

As WPI student in the class of 2015 studying to become a Mechanical Engineer, I studied the staff weapons and hand-to-hand combat of the Medieval Ages. For the DVD I applied my knowledge of filming and editing of both video and sound to finalize the footage and make it look as professional as possible. I also played the role of the "White Knight" in the video.

Daniel Haggerty

Daniel Haggerty is a junior at WPI studying electrical and computer engineering. He spends most of his time in the lab coding projects for his computer engineering classes or tutoring students in these classes. When not working on school he is working at his job or sleeping. You can often find him quoting

or misquoting a movie. Both Daniels vast knowledge and his incredible fighting skills were essential to the success of this project. You can see him in the film as the protagonist, the black knight. He can be identified not only by his black garb but also his superior speed and agility, and the way he seems to turn the drills into an art form rather than simply fighting. Daniel initially became interested in the project when he found out it would be a chance to fight Brad, his mortal enemy and roommate.

"Early in life I had to choose between honest arrogance and hypocritical humility. I chose the former and have seen no reason to change." –Frank Lloyd Wright

Jason Cardwell

I am currently studying at WPI in the pursuit of a Mechanical Engineering degree. I have always had a love for arms and armor, my room at home being decorated with miniature knights and hanging swords. When I caught wind of this particular project nothing could sway me to take another. This project really taught me a lot about the subject I love, things that I hadn't even fathomed beforehand. Although the practicality of such arts have been questioned by those that don't study them, I truly believe that this field is an important art form and outlet for creativity as we push forward into the future. My particular future is unclear, although I hope to combine what I learn here at WPI with a master's degree to become a military contractor. The fact that I enjoy studying the weapons and techniques of the past while hoping to create the same for the present does not elude me. I believe that these ancient practices will have valuable influence in the modern world, and perhaps one day we will see armor return to the field. In my spare time I enjoy reading, drawing, games with friends, and a nice cup of tea.

Andrew Aveyard

In hopes of becoming an accomplished game designer and writer, I am pursuing a double major in IMGD and Professional Writing. When I'm not working on my piles of projects and homework (the

work of a WPI student is never done), I like to unwind playing some video games or having a nice dark beer with my friends at the Boynton.

As a student and enthusiast of the arts myself, the Martial Arts of the Renaissance and the Middle Ages IQP naturally caught my eye. I've always had a vivid imagination as well, and more than a small part of my imaginings have been of this knightly era. So when I saw the opportunity to play with swords, my childhood fantasies of playing knight signed me up right away. As the project progressed, however, I realized that this IQP was so much more than just swinging around floppy pieces of metal. I feel that the project has given me a real education about the content and the context surrounding it, and I've come out of this challenging year long journey with a lot of knowledge and wisdom I never even knew existed.

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Masters:

i. **Giacomo di Grassi**

ii. **Achille Marozz**

iii. **Johannes Lecküchner**

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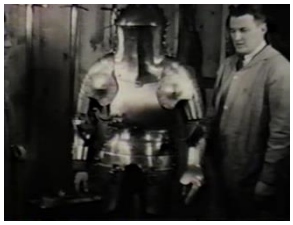
Appendix

Introduction Storyboard

If you were asked to describe the quintessential knight, how would you? Would you imagine a handsome warrior in shining armor on a gallant steed? Or would you describe a massive hulk, shrouded in thick steel lumbering through a battlefield? Present day media frequently displays medieval warriors in these ridiculous and often contradictory ways. On one end, knights are displayed as having the utmost charm and grace, living only for duty, home, and fair maidens. During battle, however, they turn into colossal brutes covered in armor, bashing away at each other until someone falls over.	• Tournament_of_the_phoenix2010-Teaser • Sword of Lancelot (1963)
-Forgeng Interview Comments (Knightly Combat)	• Interview Clip
For a long time, this was how we envisioned knights because we knew very little about them. But this started to change in recent decades when historians began to discover ancient training manuscripts of the medieval age. These uncovered manuals exposed a starkly different reality from the one media portrayed. Knights and medieval warriors were deadly fighters, but the grace and skill at winning the hearts of maidens was increased two fold when they applied their martial skill. The manuscripts reveal that knights were trained to the utmost degree, learning to wield a variety of weapon in various scenarios. They attacked with determination and precision, studying from the articulate pages of the manuscripts.	   • Longsword_rev0

-Forgeng Interview Comments (Manuscripts)	• Interview Clip
Professor Forgeng is _*Paul S. Morgan Curator*_ at the recently closed Higgins Armory Museum in Worcester, MA. The Higgins Armory Museum was a one of a kind gallery, the only museum dedicated to arms in armor in the western hemisphere until 2004. Founded in 1931 by John Woodman Higgins, the museum was a testament to the growing resurrection of interest in the field of European medieval martial arts.	  • Man_of_Steel clip
The Higgins Armory Museum was a trailblazer in the growing field of European martial arts study, and held numerous unique events to showcase the techniques that the world had forgotten. Others came to follow, and with the technological advances of late 20th century numerous organizations sprung up around the world, all dedicated to restoring this lost art. The Higgins Armory remained on the cutting edge through the Higgins Armory Sword Guild, an association founded in 1999 by two of the foremost experts in the field, Jeffrey Forgeng and Patri Pugliese. The Guild had the exclusive ability to interact with leading scholars, original copies of the manuscripts, and, of course, the ancient weapons themselves.	• Robin Hood Day 2010-2   
-Forgeng Interview Comments (Sword Guild)	• Interview Clip

This DVD will present an introduction into the concepts of European martial arts and how they are practiced in the modern world. Concepts such as footwork, strikes, and guards are presented for a variety of weapons, along with an introduction on the weapons themselves. These weapons are: cut and thrust swords, rapiers, daggers and wrestling, and staff weapons. However, we begin by introducing the fundamental concepts to combat in general. In addition, the accompanying document details all of the techniques and practices displayed in this video and should be referenced when necessary.	• Longsword, Rapier, Dagger/Wrestling, and Staff clips • Book reading clip

Cut-and-Thrust Sword Storyboard

Introduction:

The cut and thrust sword is the most well-known weapon of the medieval age. Although depicted in media as being both a stalwart icon and a brutal weapon of death, the finer points of sword combat are often lost on the big screen. Swords are incredibly well rounded and diverse weapons, performing well in a variety of situations.

-Forgeng Interview comments (Arming Sword)

Although Swords come in a wide variety of shapes and sizes, the most iconic version of the weapon is the longsword. Precise, sturdy, and flexible, the longsword is the staple knightly weapon.

It is important to note that in this section all techniques and drills apply to both one handed and two handed cut and thrust swords.

-Forgeng Interview comments (Longsword)

Ox and Plow:

When practicing swordplay, commonly used positions of readiness known as guards provide both offense and defense in varying situations. The Plow guard is primarily used to defend against and deliver lower cuts and thrusts, while the Ox guard is used to attack and defend from above. By winding between these two guards as well as changing sides, a swordsman can place himself in a variety of favorable positions for a battle.

Cuts and their Guards:

There are four main cuts available to the swordsman, and each traces a different line of attack. The Scalp cut traces the Scalp line, the Wrath cut traces the Right and Left Diagonal lines from top to bottom, the Middle cut traces the Middle line, and the Low cut traces the Diagonal lines from bottom to top.

Each cut has guards that it passes through. The Scalp Cut has the High, Longpoint, and Fool guards. The Wrath Cut has the Wrath, a slightly different version of Longpoint, and Change guards. The Middle cut has the Left Middle, a horizontal Longpoint, and the Right Middle guards. Finally, the Low cut has the Side, Hanging Point, and Unicorn guards.

Master Cuts:

There are five cuts described as master cuts that any swordsman must learn if they are to truly understand swordplay. The first two, the scalp and wrath cuts are two of the basic cuts covered early.

Accompanying them are three unique cuts that emphasize protecting one's self completely, while threatening an opponent.

The thwart cut is used to simultaneously protect one's head while striking your opponent's by helicoptering the blade above you to the opposite side.

The squinting cut also provides an attack towards an opponent's head, but does so by sweeping the blade up and over your opponent, allowing a swordsman to protect their side from attack.

The crooked cut is the final master cut and also the most defensive. By sweeping the blade in a vertical rotation a swordsman can protect himself from any possible attack, while simultaneously getting offline, giving them an advantage over their opponent.

These three cuts share a unique trait that make them much more powerful than traditional cuts. Unlike the wrath or scalp cuts, these cuts close off a swordsman's entire body to a line of attack. Most cuts move around the shoulder as the center, leaving some areas open to attack on the other side of the blade. Conversely, these three master cuts focus the movement of the blade around the wrist, allowing a swordsman to seal off his entire body on the on the other side of the blade.

Footwork:

Footwork is the base for most forms of combat, and swordplay is no different. Swordsmen have a variety of steps to utilize. These steps are the Passing Step, the Gather Step, the Sliding Step, the Triangle Step, and the Back Step.

Each step has a different purpose, and knowing the right situations for each is of critical importance. The passing step is a good technique if a combatant wishes to change his lead foot and change the distance between himself and his opponent. The Gather and Sliding steps are useful for advancing or retreating, but do so in a much shorter step, and maintain the same forward foot.

In contrast, the triangle step is a stationary step used to change sides without advancing or retreating. Note how both swordsmen maintain the distance between them while switching sides. The back step, also strives to achieve stationary defense but does so by moving the swordsman off-line in order to both avoid the attack as well as position him favorably for a counter attack.

Drills:

There are a number of drills and exercises a swordsman can perform either individually or with a partner to hone his skills.

One of the simplest, the moulinet, is also one of the most useful. The moulinet helps build the rotating motion needed for smooth, swift, and powerful movements of the blade. Performed overhead, as well as side to side, the moulinet covers all aspects of movement with the sword.

The mirroring drill is an easy routine for swordsmen of all skill levels to learn and requires two people to perform. The drill works by designating one swordsman to be the leader who will guide the drill by

choosing which steps and guards to use. The follower must then attempt to maintain distance and guard positions with the leader. – The drill can be further enhanced by adding cuts to the rotation.

The straight cuts drill is as straight forward as it sounds. Performed individually, a swordsmen goes through each of the four straight cuts: Scalp, Wrath, Middle, and Low, on each side. They can be performed stationary or while moving.

The two and four quarters drills teach swordsmen about the different targets to aim for on an opponent. More advanced swordsmen can perform this individually, but it is easiest to perform with a partner. Both drills involve one swordsman advancing to his opponent and striking one of the four corners of his opponent. In the two quarters drill, the swordsman attacks another corner on the opposite side, then retreats. In the four quarters drill, the swordsman attacks all four quarters before retreating. These drills strengthen a combatants striking technique as well as stressing the importance of striking while retreating, to protect one's self from reprisal.

In addition to drills, sequences can be performed to reinforce all the previous skills learned. In this example, one swordsman attacks with a middle cut, while the other defends with the hanging point guard. Afterwards, the defender goes on the offensive, delivering a middle cut to his opponent, and the sequence cycles from there. Once both swordsmen understand the basics, finishing moves can be added to the sequence. After parrying, a swordsman can control his opponent's weapon with either his weapon or his off hand. When controlling with the hand, the swordsman can perform a pommel strike. Meanwhile, controlling with the hilt of the sword opens up the possibilities for a disarm or throw.

More complex sequences which recreate a specific scenario can also be performed. This particular scenario, known as the-double-thwart, reinforces the cores of swordplay along with emphasizing proper use of the thwart cut. In this example, the white swordsman engages with a scalp cut, and the black swordsman responds by performing a quick thwart cut to parry. Next, the black swordsman counters by using another thwart cut to the other side. At this point, the black swordsman has the initiative, and continues the counter by wrenching the white swordsman's sword downwards, and performing another thwart cut to the same side. Afterwards, the black swordsman resets the distance by performing a middle cut from the opposite side, before cutting away. Overall this drill reinforces counters, distance, and timing, some of the most important parts of swordplay.

Rapier Script

Intro:

Rapier swordplay closely resembles one handed cut and thrust swordplay, except for a few key elements. Mainly, with rapier combat, there is a heavier emphasis on and preference toward thrusts rather than cuts for attacking.

Guards:

As with cut and thrust swords, there are two basic guards with a rapier, the low guard and the high guard. These two guards are in essence the same as Plow and Ox guard respectively, and bear much of the same responsibilities and uses. For the purposes of this DVD, however, only the low guard will be covered in the techniques.

Training Drills:

Switching Guards-

The switching guards drill is performed almost exactly how one would expect. A swordsmen changes from right low guard and left low guard, keeping the point aimed at his opponent's forehead and shifting the hilt from one side to the other just enough to close the line.

Maintaining Distance-

To perform this drill, swordsmen pair up and face each other in right low guard. A designated leader in the pair moves forward and backward with sliding steps and the follower must maintain his distance.

Mirroring-

Much like the cut-and-thrust version, the rapier mirroring drill involves a leader randomly changing guards and stepping, with the follower imitating the guard while maintaining his distance.

Thrusting to Targets-

In this drill, one swordsman holds his sword artificially on the center line. While he does this, another swordsman practices thrusts to either side of the stationary sword.

Closing the Line Drills-

Both swordsmen must first start in either left or right low guard. One swordsman thrusts to the exposed target, while the defender shifts his guard to the opposite side, effectively closing the line. During the defender's attempt to do this, there are a number of additional actions that can be taken. If the defender successfully manages to close the line, he can then add a riposte (a thrust that keeps the line closed) after it. The defense and riposte can even be merged into one single action if needed. Additionally, while the defender is trying to close the line, the attacker has his own options. He can disengage into a lunge on the opposite side, or can move to enter a grapple by passing forward with the parry. To grapple successfully, however, the attacker must control the defender's blade with his hilt or with his free hand while moving. After doing so, the attacker will be in a position to deliver a pommel strike if he grabbed the blade with his hand, or a throw if he used his hilt.

Keeping the Inside Line-

A paired drill, one swordsman begins by taking the inside line from his opponent, either by changing engagement or moving his blade across. The opponent then responds by retaking the inside line. The initial swordsman should also implement sliding steps backwards and forwards, and the opponent must maintain distance. The swordsman that first took the inside line occasionally retakes it while stepping now, and the opponent must respond appropriately.

Attacking in Time-

Both swordsmen reset to right low guard. Keeping stationary, one swordsman switches sides to left low guard to take the inside line. The opponent evades contact to change engagement, extending into a short lunge to attack and closing the line by turning the true edge against the initiating sword. While doing this, the opponent is said to be attacking in time.

Principles Script

“Leverage is an important concept in martial arts. Here we can see an equation that describes leverage. The equation shows the relationship between two different forces and the distances at which they are applied. Observe the forces on this sword. They are equal, but they are at different distances from hilt of the sword, where it rotates. This equation tells us that in order to have the same effect, the force closer to the hilt will actually need to be much larger than the other. This is important when parrying an opponents strike. Catching the opponents blade closer to the hilt of your sword will minimize the force you feel on the sword, allowing you to keep control.”

“Speed is another very important principle. The key concept here is the difference in the speeds of the tip of your blade versus the part closer to the hilt. Here we see a sword swinging in an arc. We can measure the distance that the tip of the sword travels, as well as the distance the forte travels. We see that the tip has travelled much further during the swing than the forte has. Applying some simple equations to determine the distance, and putting those into our speed equation, which is distance divided by time, we see that the tip of the blade is travelling three times faster than the hilt. This means the power at the tip will be much higher. Speed is important to understand not only for martial arts, but for dancing as well.”

Wrestling Script

Introduction –

Though knights are trained to wield a wide variety of weapons, perhaps the most important skill comes when a knight has lost said weapon. Wrestling and dagger play is core to a knights training, as almost all armored duels eventually end in wrestling. Streets ahead of their modern WWE counterparts, knights displayed a beautiful amount of skill and precision in their hand to hand engagements.

Techniques –

There are a wide number of techniques to use against one's opponent when wrestling. Each of them focuses on controlling the opponent's weak points, disarming, or throwing. Some techniques, such as the high and low key, focus on maintaining control of the opponents weapon while simultaneously inflicting serious damage to the shoulder joint. Throws concentrate on ruining an opponent's balance by shifting their shoulder, hips, or legs out of alignment. Some techniques even prepare one to intercept a passerby with aggressive intent.

Drills –

In the push drill, both combatants grip each other in the standard stances; shown here is the Reciprocal Grip, where both combatants grab ahold of each other's arms, with one hand on the inside and the other on the outside; and focus on throwing one another off balance. This drill teaches a student how to effectively maintain their balance, control their opponent, and read intent.

Another useful drill is the disarm flow drill. This drill consists of one combatant attempting to strike the other with a dagger. The defender smoothly disarms his opponent; and using the dagger to strike back, their roles reverse.

Other drills consist of practicing select techniques repeatedly, paying attention to perfecting the movements.

Staff Weapon Script

Introduction –

Although not as famous as the sword, staff weapons were an integral part of every knight's armory. They provided excellent reach, caused heavy damage, and weapons like the spear could be even more precise than the sword.

Grips and Guards –

The main difference between swords and staff weapons is grip. The staff is gripped with the dominant hand on the upper part of the staff to drive the weapon, with the secondary hand helping control the weapon from the bottom. The grip is versatile and can be slid up and down the staff, giving more power and reach, or more control.

Like swords, there are four main guards for staff weapons. They consist of the high reverse, low forward, low reverse, and high forward guards. There is one additional guard, the head guard, which the combatant uses to stop an overhead strike.

Drills –

The drills for staff weapons are almost identical to the cut and thrust techniques. The moulinet rotates the weapons in a similar manner to the swords, reinforcing the rotational movement necessary for combat.

Driving and mirroring drills are also important to staff techniques. The former involves one combatant repeatedly striking the opponent while advancing, forcing them to defend and retreat. The mirroring drill consists of a designated leader moving through guards, steps, and strikes, while the follower mirrors their movements.

Similar to the sword section, a flow drill can be performed with staff weapons. In it, each combatant takes turns stepping into range and delivering strikes with both ends of the weapon on both sides of the opponent. The aggressor then resets the position and the opponent advances.

In addition to these drills, select sequences can be formed to extend the knowledge base. In these sequences, combatants practice a series of movements akin to a mock fight, focusing of performing each technique correctly. They then perform the sequences faster until reaching normal speed.

Notes on video production

- Determine film quality (HD/SD, frame rate, etc) before starting and keep that throughout the project. Perhaps you could even request the same equipment each time.
- White balancing helps with post production color editing.
- Pause between question and speaker's answer to allow time for transitions, fades, cuts, etc.
- Pose topics to the speaker ("talk about ____") – don't ask questions. This is easier to incorporate into the video.
- Speaker should try to avoid referring to the interviewer's statement.
- Background sound should be minimized. (AC, vacuum, cars, doors, footsteps, papers rustling, background conversations, etc.) You WILL hear it on the mic.
- Be careful of personal mic attachment (can be heard when bumped/ rubbed from cloths or hand gestures). Use directional mics or area mics in a silent environment.
- Be careful with camera pans – test first, know where/when to pan, make sure the tripod is loose enough to allow fluid motion but secure enough that the camera won't move on its own when released
- Take note of any artifacts referenced