

**THE HALBERD
AND OTHER
EUROPEAN POLEARMS
1300-1650**

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Cover Illustration: A poleaxe of the mid 15th century superimposed over a late 16th century woodblock print by an unidentified artist. This illustration which was removed from a 17th century German text, shows warriors (*Dopplesoldners*) carrying two-handed swords with S-shaped quillons, a type which had disappeared by about 1600, and "half-moon" shaped halberds.

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EUROPEAN POLEARMS

The years between about 1200 and 1650 saw a decline in importance of armored horseman on the battlefields of Europe, a decline which was initiated by the appearance of missiles delivered by the longbow or the crossbow and ended with the development of the firearm. During these years an old weapon, the polearm, reappeared which gave increased importance to the role of the infantryman and was an additional factor in the end of the dominance of the armored cavalryman.

The study of armaments of this period has been mainly centered on the sword and armor, and the polearm is a relatively neglected subject, classified as a secondary weapon, and relegated to the end of the literature on the subject.

There are probably several reasons for the neglect of this important weapon: there is an aura about the sword that made it the representative of knightly virtue which was not extended to the polearm used by peasants; many polearms were crudely made and do not have artistic, aesthetic or monetary value; the wooden shafts of these weapons do not stand the ravages of time as well as metal, and because of their lesser

value they were not as carefully preserved as the sword. And finally it must also be realized that their period of significance was brief.

The definition of a polearm is a weapon mounted on a shaft or a pole. They are classified according to their use as

- thrusting,
- cutting,
- percussion,
- combination types.

The percussive weapons can be subdivided into either crushing or piercing types. Most polearms are two-handed in use. The arrow, quarrel and javelin are not included as they are classified as missile weapons.

As the title suggest, the scope of this treatise will be limited to European infantry polearms from the later Middle Ages through the early Renaissance. It is hoped that it will serve to promote a greater appreciation of these weapons and that it will also provide a system of identification of the many and varied types. The emphasis will be on the halberd, which along with the pike, is the key to the rise in importance of the polearm.

THE HALBERD: CHARACTERISTICS AND DEVELOPMENT

Rex Boemus vidensque eorum instrumenta bellica et vasa interfectionis gesa in vulgar! heilbarten, amirans ait: o quam terribilis aspectus eat istius cunei cum suis instrumentis horribilius et non modicum metuendis (The King of Bohemia saw their weapons called Halberds and how easy it was to kill with them. He says with amazement "What a terrible aspect of this formation with their horrible instruments of death").¹

The stone axe predated the appearance of modern man and is consistently identified with Homo erectus and Neanderthal sites which are more than 3000 years old. In the beginning, the hand axe, a stone or celt wielded in the hand, progressed to a

stone axe head fastened to a shaft. The most logical technique was to split the shaft, insert the head and secure it with lashings of sinews or rawhide. This was followed by inserting the shaft into a hole in the head and with this the axe had essentially



Fig. 1. A stone axe attached to a split shaft and secured by rawhide thongs. This is a modern example made by Iroquois Indians.

reached its final form, only to await advances in metallurgy to obtain stronger and more durable tools and weapons.

The halberd is an axe blade surmounted by a thrusting point backed by a pointed beak. This three part head is secured to a six to eight foot long shaft by a number of nails generally inserted through long straps known as langets. The langets extend along the shaft from the head towards the butt. The nails may be fastened from one side straight through the shaft to appear in a hole in the opposite langet and then peened over or alternatively they may be staggered so that they strike the opposite langet and are bent in a curved manner to lock themselves in place. The head weighs about four pounds depending on the size of the blade.

The first recorded mention of the halberd is found in a poem about the Trojan War by Konrad of Wurzburg written sometime before 1287. It mentions 6,000 men, many carrying halberds.

There are two theories regarding the halberd's initial appearance. One, sug-

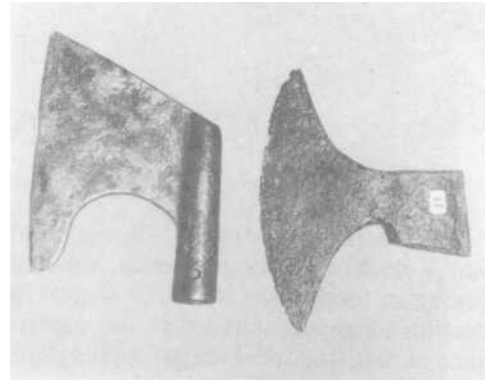


Fig. 2. Examples of early axes with a single eye socket for the shaft. These could be used as a weapon or a tool.

gested by 9th century murals preserved in Zurich, argues that the halberd evolved from sword blades fused to wooden shafts. The other and more plausible theory holds that the weapon developed from the fighting axe. The two handed axe favored by the Vikings is well documented. One scene in the 11th century Bayeux Tapestry clearly shows a Saxon footsoldier with an axe felling a horse, displaying the power of the weapon. It appears doubtful that a hafted sword blade would be sturdy enough to perform the same deed. Furthermore the skill necessary to produce a good sword blade was rare and it would be most wasteful to use a good sword blade in this manner. It is more logical to conclude that the halberd arises from the axe while the glaive is the descendant of the hafted sword blade.

The halberd undoubtedly developed as a means to extend the reach of the soldier, and at the same time provide him with a more useful weapon for close combat. That it succeeded will be amply demonstrated.

The early halberd is essentially a two eyed axe: a simple axe blade with two eyes rather than one. The reason for the second eye was to minimize breakage of the shaft by increasing the attachment to the wood as the single eye maximizes the stress to a single relatively narrow point. By widening the distance to two separated points the



Fig. 3. Early form of the halberd. Essentially it is an axe with an elongated blade and two eyes. The upper edge is sharp and is a rudimentary spear. The eyes are square and the lower eye has a single hole for fastening to the shaft.

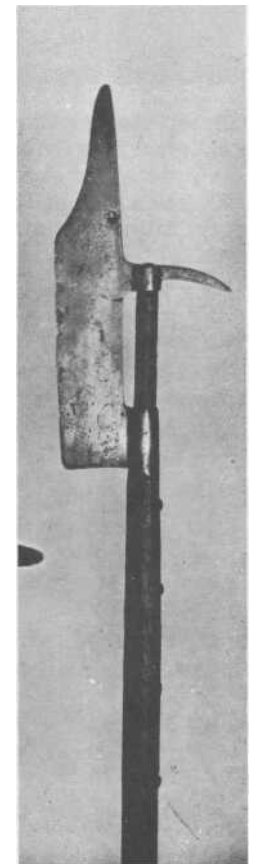
Fig. 4. Another variation of the halberd. The upper edge of the blade has been elongated to form a thrusting spear and the point is reinforced. The lower eye is elongated to form a rudimentary langet on the back side of the eye.

Fig. 5. Early halberd. It still has two eyes but now has a definite spear on the back edge of the blade. This represents the beginning of the true halberd as the spear is designed for deliberate use in thrusting. It has an early beak welded to the upper eye.

stress is spread over a wider area and the junction is potentially stronger.

The earliest halberd that can be positively identified and dated is one in the Berne Historical Museum recovered from the battlefield of Morgarten which took place in 1315. It has a nearly rectangular blade with two eyes and the upper end extended to a point for thrusting. One with a more crescent shaped blade and a rudimentary beak is found in the same museum. The blade shown above (Fig. 3) is consistent with the Morgarten type and the fact that the upper point is not prominent would suggest that this is perhaps an early design.

An early illustration of this type is found in the Votive Tablet of St. Lambrecht (c.1430) in the Landeszeughaus Graz. A woodcut discovered by John Waldman, my colleague and fellow collector, published by Johann Stumpf in the mid 16th century but



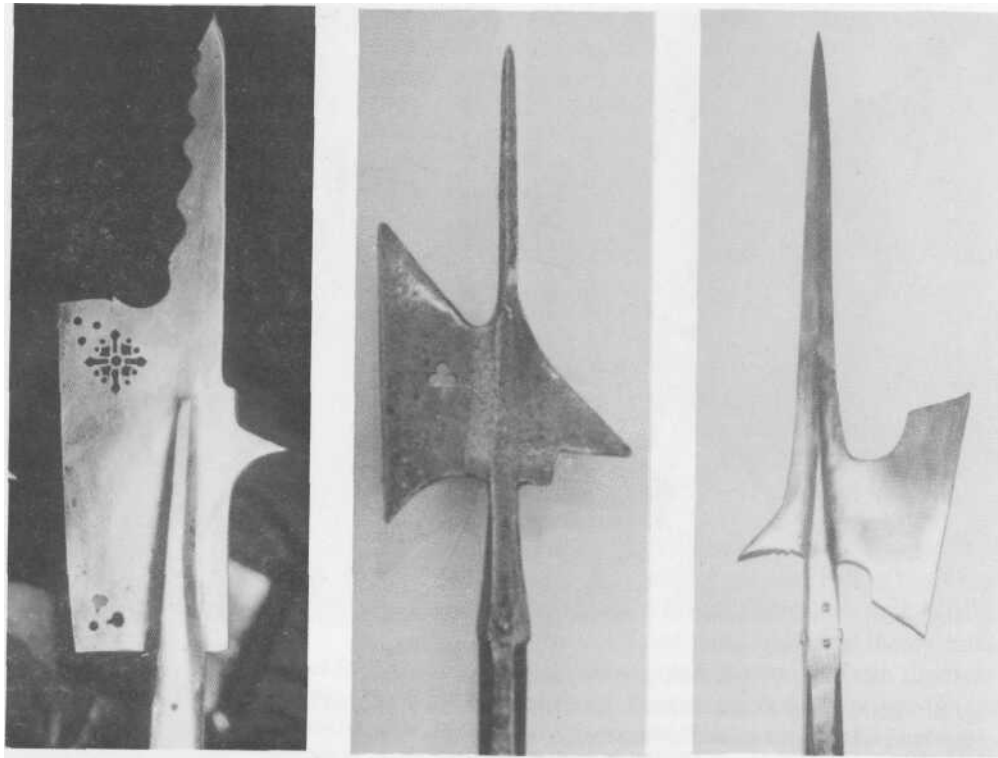


Fig. 6. An Early form of halberd which has a flat rectangular blade with a rudimentary beak and no flange. The spear is flat with no median ridge, c. 1420.

Fig. 7. Early Landsknecht halberd with the edge of the blade parallel to the shaft. It has a flange at the base of the beak, c. 1480.

Fig. 8. Early Landsknecht halberd with a slightly oblique blade, a rudimentary beak, and no flange. The long flat spear has a median ridge, c. 1450.

depicting an event of the 14th century, illustrates a similar example with a wooden shaft extending beyond the blade and sharpened to a point. Wagner shows several of these types in his illustrations taken from sources as early as 1315 which would make this blade contemporary with the Morgarten blade.

At that time the rear facing beak was added. This will be found attached to the upper eye or sometimes as a separate detached part of the head with its own eye between the two eyes of the axe blade. It

The Blade

The most striking change in the halberd's appearance is in the shape of the blade. The earliest blades were rectangular as noted above, and the ratio was of greater

length to the width of the blade. This gradually changed to a greater width of the blade although the edge remained parallel to the shaft. (Fig. 7) Realizing that the cutting

was soon simplified by combining the eyes into a socket and forging the beak to the back of the socket. This gives the halberd the basic form which persisted throughout its existence. The changes in design of the halberd from this time onwards is very fluid. While it would be desirable to precisely date them, it cannot be done. Instead changes in the appearance of different parts of the weapon will be noted, and later these will be combined to make some stylistic order of its development.

length to the width of the blade. This gradually changed to a greater width of the blade although the edge remained parallel to the shaft. (Fig. 7) Realizing that the cutting

action of the blade can be produced either by the application of strength and weight or by the use of a slicing motion, the design was modified. The most common change was an oblique angle to the cutting edge as seen in the type most commonly associated with the Landsknechts of the 15th century. (Fig. 8)

Concurrently, but slightly later curved edges appeared and these developed into pronounced concave or convex curves. These shapes were less effective against plate armor although they were efficient against an unarmored opponent. As the halberd became more decorative the concave shape became more pronounced, but the last really effective fighting halberd was known as the "Sempach" halberd names after the the 14th century battle at Sempach which was introduced in the 16th century. It had a slightly convex curve.

The Spear

The spear portion of the halberd began as a prolongation of the upper point of the axe blade but it soon became a prominent part of the head because of the desirability of having a thrusting point. At first it had a flat spike which gradually became elongated. As it lengthened, it becomes weaker and more likely to bend. It was then reinforced with a median ridge which evolved into a quadrangular shape. It remained with

The Beak

The beak started as a simple spike on the back of the weapon. (Fig. 5) After it became attached to the blade it remained as a short flat beak for a short period, but then became longer and as it did, it gradually inclined towards the butt end of the shaft. This inclination eventually became a defi-

The Socket

The socket for the shaft is first positioned at the rear of the head when it is formed from a merging of the two eyes. It then appears to move forward towards the center of the blade and in front of the spear

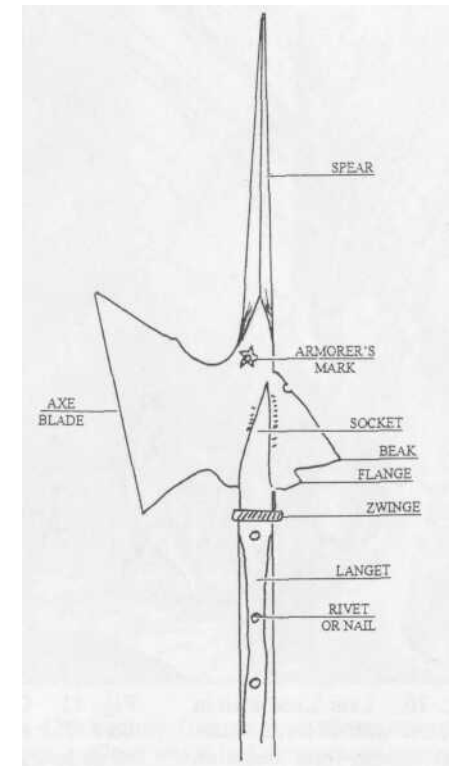


Fig. 9. Nomenclature of a classic 16th century Landsknecht halberd.

this appearance, except for the "Sempach" halberd which became shorter and flat, with only a minimal median ridge.

nite angulated shape and a wider base or flange appeared. As the concave shape of the blade appeared, the point became reinforced by changing to a quadrangular shape at the terminations. This same reinforcement is also seen at the point of the spear and on the tips of the axe blade.

(Fig. 18). Finally, it occupied a position in line with the spear, but in the process it developed a slight curve backwards towards the beak (Fig. 19), before assuming a straight socket in line with the spear.

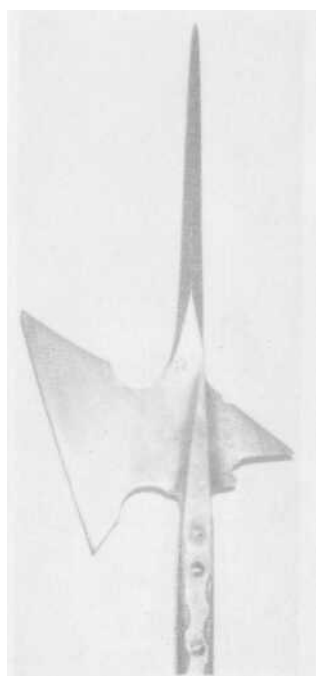


Fig. 10. Late Landsknecht halberd with oblique blade. This classic form bears an unidentified star shaped armorer's mark on the blade at the spear's base, c. 1500.

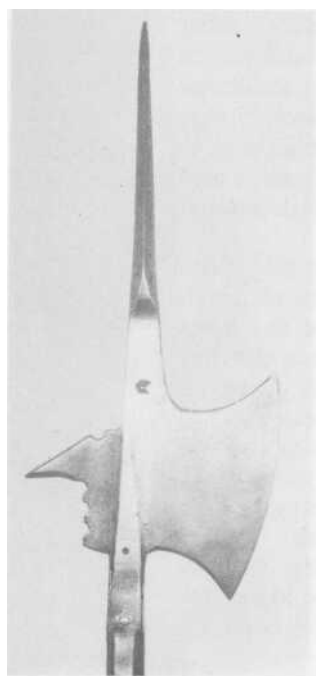


Fig. 11. Convex bladed halberd. The spear is flat for part of its length before becoming quadrangular, c. 1520.

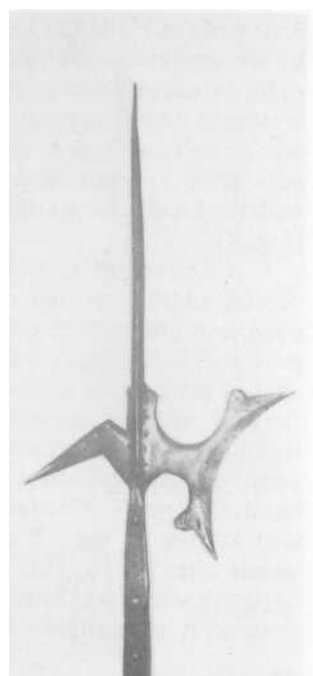


Fig. 12. Concave axe blade which is lighter in weight has reinforced tips indicating that it is still a weapon and not merely decorative, c. 1580.

head, additional langets were applied to the shaft. These extra straps were not attached to the head as they were initially, but simply attached to the unprotected sides of the shaft. The early langets were usually applied on the surface of the shaft while later ones were often inlaid into the wood.

be available and oak or other varieties of wood can be seen on the earliest halberds. In the 16th century the "zwing," a small movable collar which strengthened the junction of the shaft and the head at the socket may have been added.

Armorer's marks are many and varied but only a few, such as those of Erhardt Meillen and Lambrecht Koller who were



Fig. 13. This illustration which was removed from a 17th century German text, shows warriors (*Doppelsoldners*) with two-handed swords with S-shaped quillons which had disappeared by about 1600, and "half-moon" shaped halberds.

active in the 17th century, have been identified to provide a fairly precise date. Marks on the shaft are usually arsenal marks but they are of little help in dating.

The summary of halberd identification which follows is designed to serve as a rough guideline to halberd identification and dating although they cannot be precise. These weapons were manufactured in

many different parts of Europe and styles differed slightly, even in adjacent towns and one location might be a little more, or a little less, technically advanced than its neighbor. Armorers would undoubtedly adapt to the wishes of their customers. Furthermore production and use of earlier types may persist locally into a subsequent century.

A HALBERD CHRONOLOGY

13th Century

- Early prototype is essentially a two eyed axe
- At end of century: Blade long and thin, slightly curved and comes to a point
- Spear not well defined
- Eyes are square, later becoming round
- Small beak between eyes or integral with upper eye
- Blade secured by nail in either the lower or both eyes

14th century

- Upper eye may be smaller than lower eye
- Upper edge of blade elongates and indents to form a true spear
- Head becomes larger and heavier and more rectangular

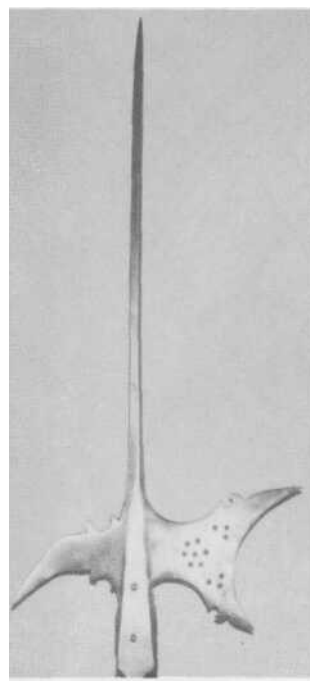


Fig. 14 Small halberd with a concave blade. The absence of reinforced points suggests that it was intended as a ceremonial weapon, c. 1580.

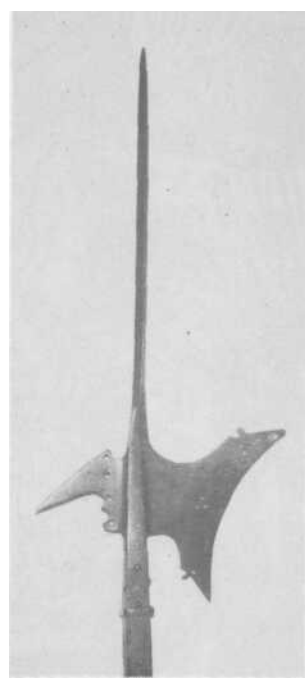


Fig. 15. Late halberd with unreinforced tips, again intended for ceremonials but perhaps as a weapon in an emergency, c. 1600.



Fig. 16. The Sempach halberd is the final compromise to create an efficient weapon. This one bears the mark of Lamprecht Koller of Zurich, c. 1620.

- Beak becomes integral with head
- Eyes merge to become a socket
- Axis of spear is in front of shaft
- Spear is short and sharpened on both edges. May have reinforced points
- Rudimentary langets integral with small socket appear

15th century

- Early blades are rectangular, later becoming oblique.
- Spear moves back towards the beak, to be aligned with the shaft
- Spear elongates and may develop a medial ridge in the last half of century.
- Beak is more robust, flange appears and beak angulates slightly towards the butt
- Langets become heavier and longer
- Second set of langets appear
- Socket curves towards the flange

16th century

- Spear becomes very long with pronounced medial ridge producing a quadrangular cross section
- Occasionally a flat spike with medial ridge
- Concave edge appears and head becomes smaller late in the century
- Langets number two to four and are less robust.
- Socket becomes straight c. 1530 to 1540

14th Century

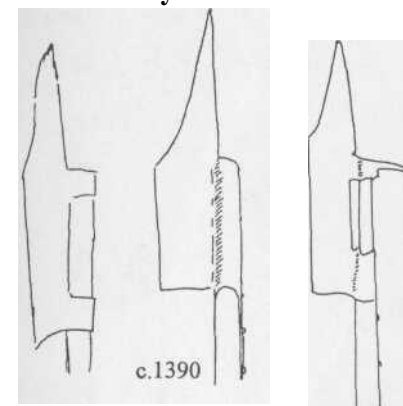
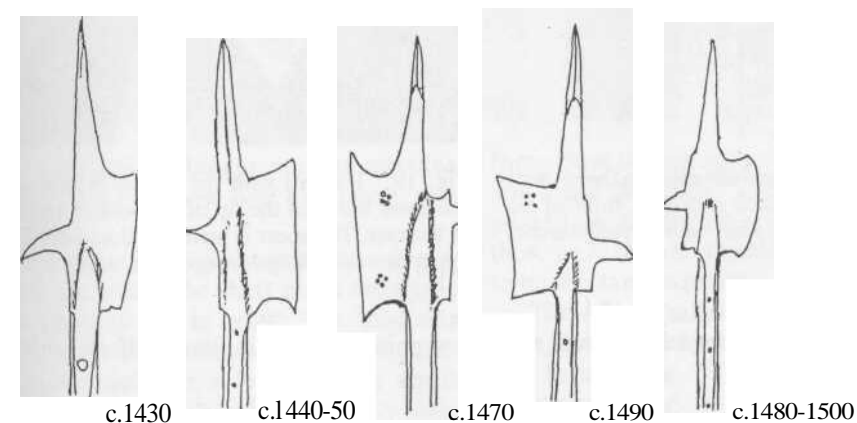
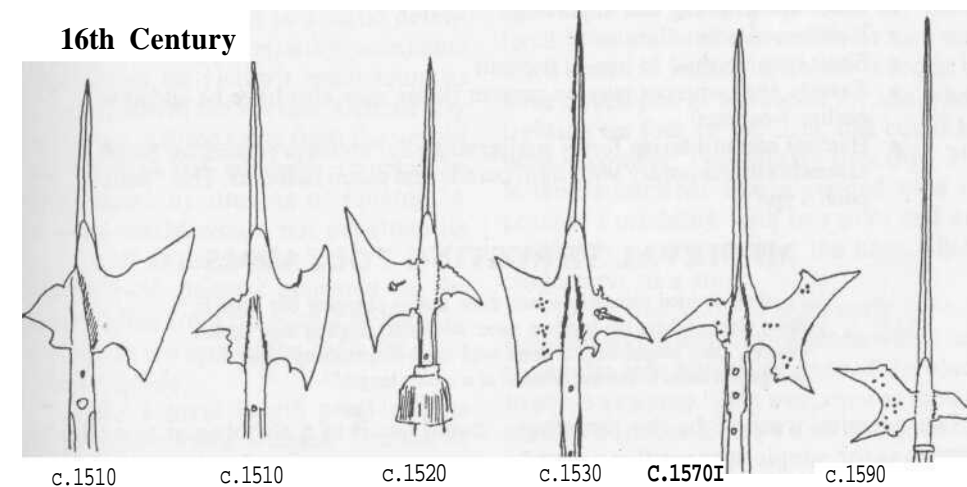


Fig. 17. Evolution of the early halberd.

15th Century



16th Century



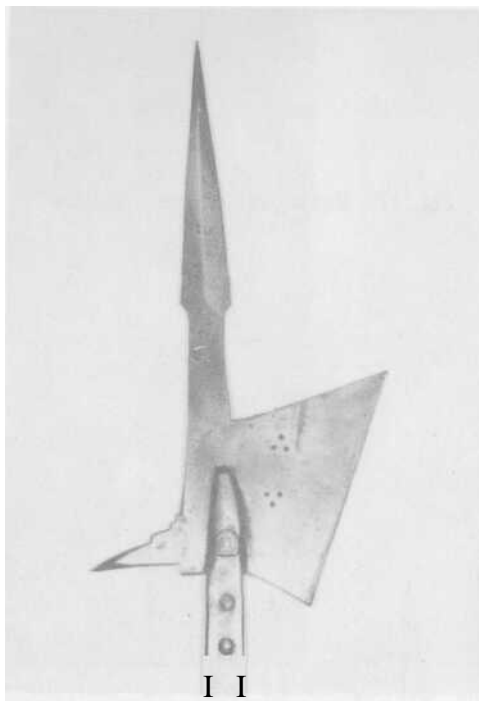


Fig. 18. Early Landsknecht halberd with oblique blade, a tapered socket in front of the heavily reinforced spear, and a rudimentary flange, c. 1420.

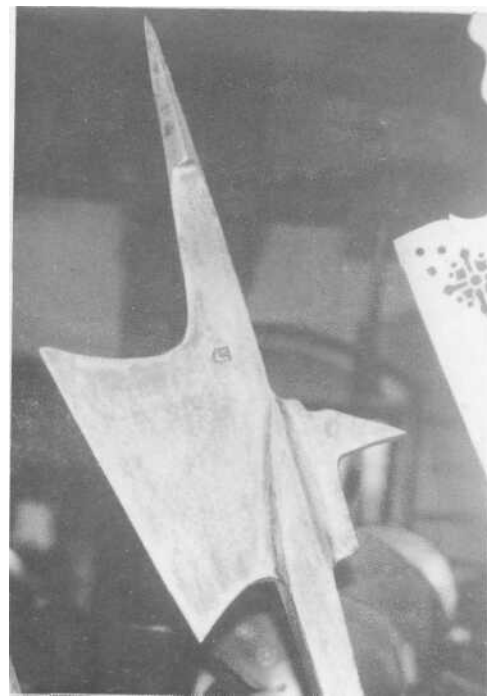


Fig. 19. Halberd with the socket in line with the spear but with the tip of the socket inclined to the rear. The spear is mainly flat and only the upper one-third is quadrangular, c. 1500.

- Zwinge (or collar) appears
- Crescent shaped blade with reinforced point, appears in latter half of century

17th century

- Pronounced crescent shape or light square head with short spike
- Elaborate piercing and engraving
- Reinforced point eliminated
- Shaft may be shod in iron at the butt
- Tassels and covering may be present (these may also have been added to earlier weapons)
- Heavier and utilitarian forms similar to earlier styles produced for Swiss arsenals contemporary with light parade and guard halberds. The "Sem-pach Type"

MEDIEVAL THRUSTING POLEARMS

... they divided themselves into three troops charging our lines in three places where the banners were: and intermingling their spears closely, they assaulted our men with such impetuosity, that they compelled them to retreat. Almost at a spears length"²

The premier weapon in the thrusting category is the simple spear with a pointed head on the end of a shaft. The foot soldier

could use it as a stabbing or as a throwing weapon or javelin. In the period that is being considered, however, the javelin, had

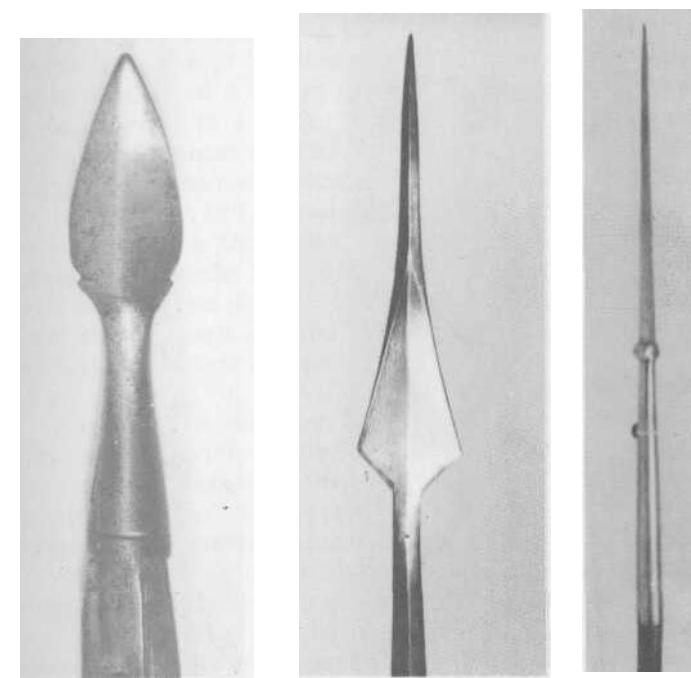


Fig. 20-22. Pike heads which would have been on shafts of 16 to 20 feet length. The heads are small to allow more efficient penetration and there are three principal types: *Left*: leaf shaped; *Center*: lozenge shape; *Right*: needle shape.

been replaced by longer ranging missiles such as the crossbow bolt or quarrel, and the arrow.

The spear used by the infantry was primarily the pike. The shaft was a long pole from 16 to 20 feet in length. The head was small and could be shaped as a leaf, a quadrangular needle or a lozenge. The small head was necessary because relatively little force could be used. Defensively the pike was usually held locked in a static defensive position and its penetrating force came as much from its victim's momentum as from any action of the wielder. Offensively the penetrating force came from the weight of the wielder and whatever impetus he could generate by running or lunging. A wide head would not penetrate its target as well as the smaller head.

About 1450, langets appeared on the shaft extending from the socket of the pike head towards the butt of the shaft for 40 to 50 cm (20 inches).

The pike's great length precluded its use as a close combat weapon. The use of the spear as a stabbing weapon must come from a shorter spear which generates its

force from the strength of the holder's arm and back muscles. These weapons appeared in many shapes, and frequently there were different names for what appear to be the same weapon.

The *ahlspiess* (awlpike) and the *military fork* are weapons with narrow heads. The former (Fig. 30) is simply a long thin strong quadrangular awl or needle with a disc shaped guard at the base between the shaft and the blade to protect the users hand. The blade of the needle or awl was often about 50 inches in length. It seems to have developed as a weapon for use when fighting on foot in the lists, but could be used in combat. The military fork (Fig. 29) looked somewhat like a rugged type of peasant's pitchfork with two tines and occasionally a projection at the base which could serve as a stop.

The *lugged spear* was an early type of polearm with a leaf shaped blade which had triangular side lugs at the base of the blade to serve as a stop. This weapon was mostly seen in northern Europe and is associated with, but not limited to, the Vikings. The Viking version or *flugellange* is found as early as the 11th century.

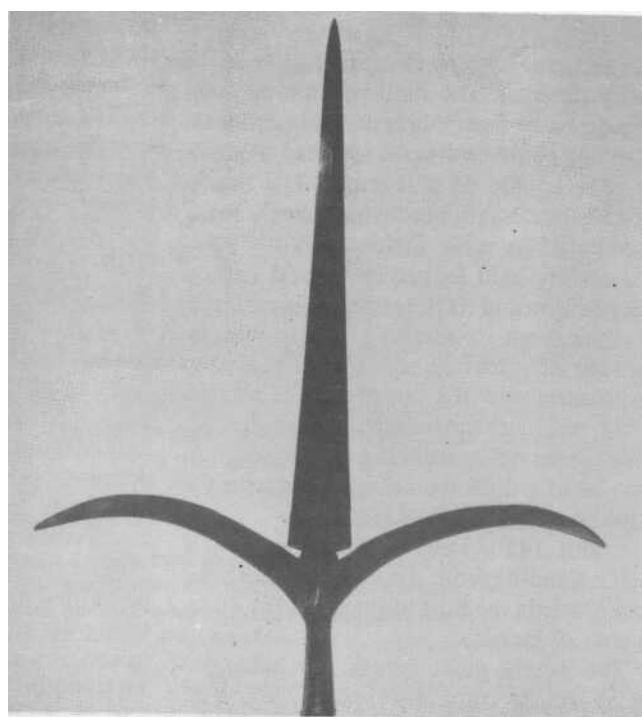
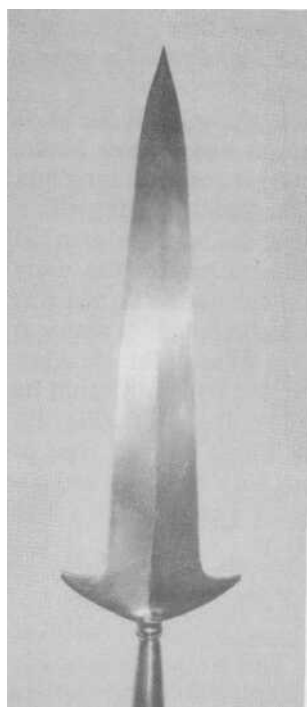
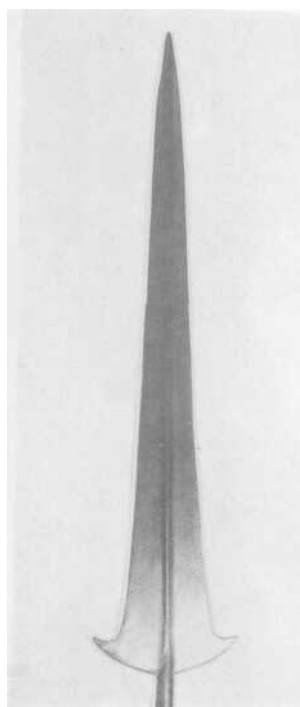
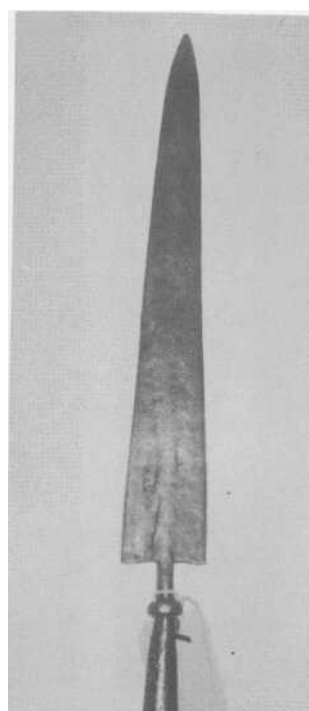
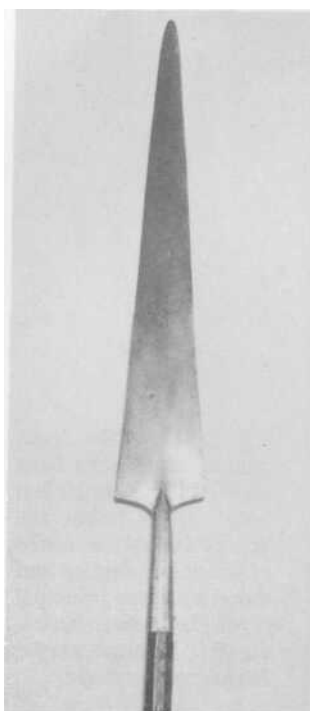


Fig. 26

Fig. 27

The *langue-de-boeuf* (Fig. 23, 24) or ox tongue has a flat or longitudinally ribbed blade of a either a square or triangular shape, tapering to a point. There are no blade protuberances and the earlier types had plain sockets and no central ridge. In the 16th century, belt or band shaped decorations occur on the socket and medial ridges on the blade. Some 15th and early 16th centuries are difficult to distinguish from slender partisans and perhaps too much is being made of separating the two weapons.

The *early partisan* (Fig. 25, 26) looks very similar to the *langue-de-boeuf* and from which it probably evolved. The early form showed small wings at the base and a more or less pronounced central ridge on an otherwise long nearly flat triangular blade. Langets appeared at about the same time as on the pike. As time advanced the wings grew larger and assumed more fanciful shapes, and the blade became shorter. By the end of the 16th century belted swellings on the socket are found. In the 17th and 18th century it was used mainly by officers as an indicator of rank although it

was still a useful weapon when needed. The wings eventually became partly divided appearing somewhat like a fleur de lis.

The partisan, in one form or another is the most common and the longest lived of the thrusting spears. In fact several of these spears are merely different versions of the partisan.

The following group of weapons are really different versions of the partisan depending on the shape and style of the wings. The *corseque* (*Korseke*) (Fig. 27) had curved wings bending back towards the butt of the weapon. The *runka* (*spetum, ranseur*) (Fig. 66) had the wings curving towards the tip. The *chauve soitris* (Fig. 31) is a spectacular version of the *runka*. The wings are sharply angled towards the tip and notched to give them a bat wing appearance.

Despite the many styles of this class of polearms it must be remembered that they were fighting weapons. The blades of the *langue-de-boeuf* and its descendants were sharpened at the edges and on the wings so they could be used to thrust or to slash, and cause a devastating wound.

CUTTING POLEARMS

"and when the arrows were exhausted, seizing up axes, poles, swords, and sharp spears which were lying about, they prostrated, dispersed, and stabbed the enemy."³

The cutting type of polearm is typified by the *couteau de breche*, a weapon which looks somewhat like a knife blade mounted on a shaft. It has a mildly convex shape with its cutting edge on the convex side. Its

probable origin was when either a knife or sword was attached to a pole to increase the reach of the wielder.

The *military scythe* (Fig. 42) looks much the same, but with a longer blade. It

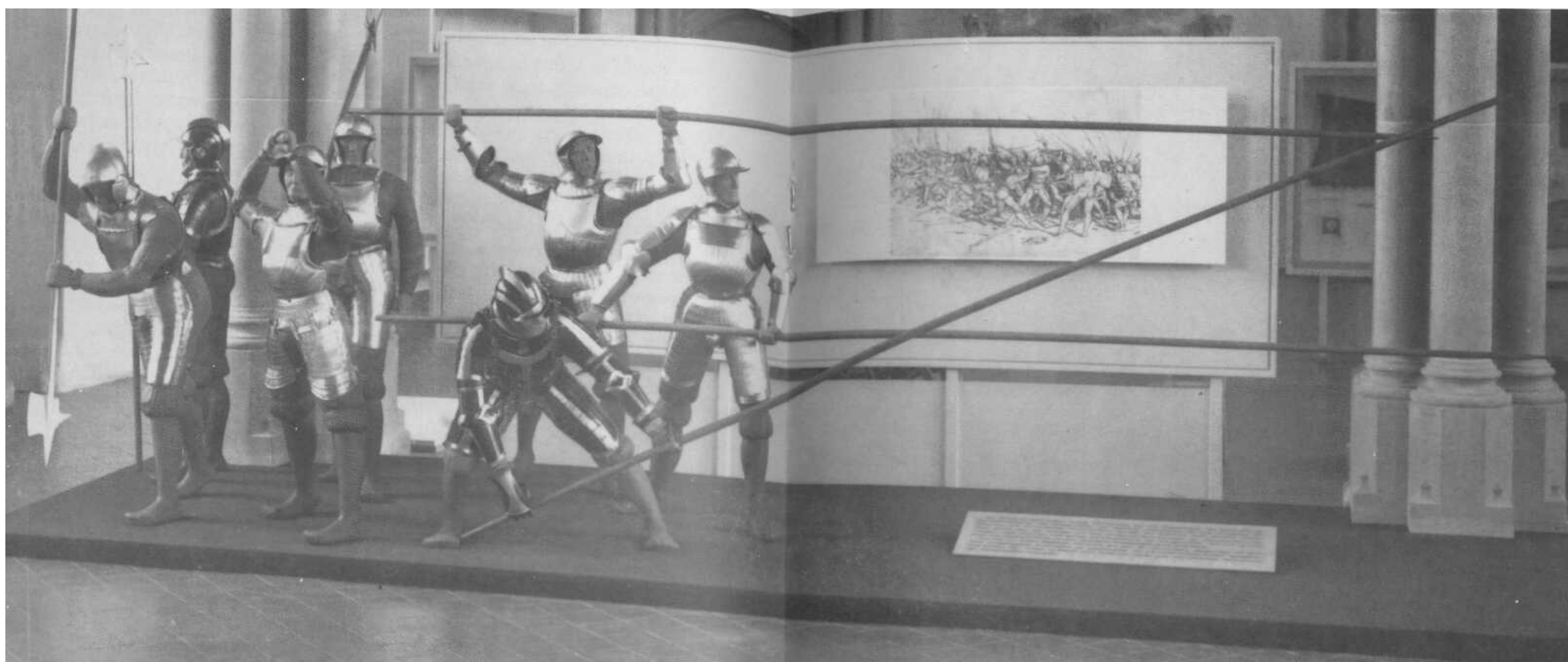
Fig. 23. *Langue de boeuf*. A typical form with a long flat triangular blade and no wings at the base of the blade. 15th century.

Fig. 24. *Langue de boeuf*. Slightly later version with a rudimentary median ridge which strengthens the blade. Blade has a node on the socket below the blade. There are no wings on the blade. 16th century.

Fig. 25. Early partisan with flat blade. The long slender median ridge and small wings serve to identify it. c. 1500.

Fig. 26. Later partisan. It has definite median ridge which strengthens the blade, the wings are larger and the socket has a node between the socket and the blade. The blade is 20 inches long from socket to the tip, c. 1600.

Fig. 27. *Corseque*. A form of partisan with long slender wings curving backwards towards the butt and sharpened on the side towards the tip. The increased size of the wings would serve to widen its area of effect, but it could also hinder recovery from a thrust with its tendency to entangle the wings in any obstruction.



is essentially a scythe-like blade mounted on a pole with the blade being a continuation of the pole rather than at right angles to it. It differs from the *couteau de breche* (Fig. 52) as its cutting edge is on the concave side as it would be in the agricultural tool.

The *glaive* (Fig. 33, 54) and *fauchard* appear to be the same weapon and the word *glaive* appears to be the earlier term, possibly originating in the 13th century. They can be described as a large *couteau de breche* which may have a small extension on the back which would act as a parrying hook.

The *doloire* (Fig. 34, 53) is a form of battleaxe with a large blade, pointed at the top and rounded at the bottom. It is a two handed weapon, and is much the same as a broadaxe. In some sources it is called a

wagoner's axe, but is generally indistinguishable from the style of a German type of broadaxe. Some of the *doloires* have engravings on the blade.

Two axe like weapons which have national associations are the *bardiche* and the *Lochaber* axe.

The *bardiche* (Fig. 41, 47) has a long crescentic blade extending far beyond the pole and attached to the shaft with a socket at the upper end and a flange at the bottom which was nailed to the pole. It is mainly associated with Russian infantry of the 16th century.

The *lochaber* (Fig. 32) axe usually has two sockets attaching a large curved blade to a pole. Its characteristic feature is a hook at the upper end facing the opposite direction from the edge of the blade. The hook probably appeared later than the early Ren-

aissance. Its use is open to speculation. Along with the *Jedburgh* axe it is associated with Scotland.

The *Jedburgh* axe is somewhat of a mystery. In the early 17th century they were known as *Jedburgh staves*. The only published picture that this author is aware of is of the one in the Metropolitan Museum of Art in New York which was described by Dr. Bashford Deane and illustrated in "Stone's Glossary."

The *guisarme* (Fig. 55) is an unusual weapon consisting of a slender curved

blade with the cutting edge on the concave side, and with a sharp hook extending from the base of the blade at the back and then turning at a right angle towards the tip of the blade so that the wielder has both a sharp cutting blade and a slender thrusting instrument. Its efficiency in combat is doubtful as they appear too fragile and it may be that they were used as a weapon for bodyguards.

These weapons can also be used for thrusting, but their primary use appears to be for cutting. In some respects their use is similar to the halberd, but we have put them in a separate category because of their longer cutting edge and because they do not (with the exception of the *doloire*) have the weight or heft of the halberd. It is difficult to imagine these weapons cutting through plate armor.



Fig. 29. Military Fork - A development of the pitchfork. The tines are straight and there is usually a stop at the base to limit penetration.

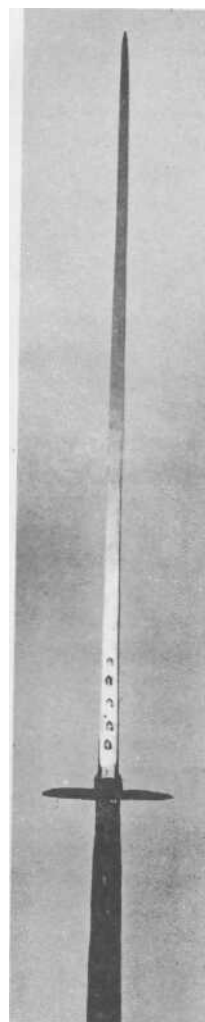


Fig. 30. Awlspieß (awlpike) - A long but rugged needle which has a circular hand guard mid way between point and butt.

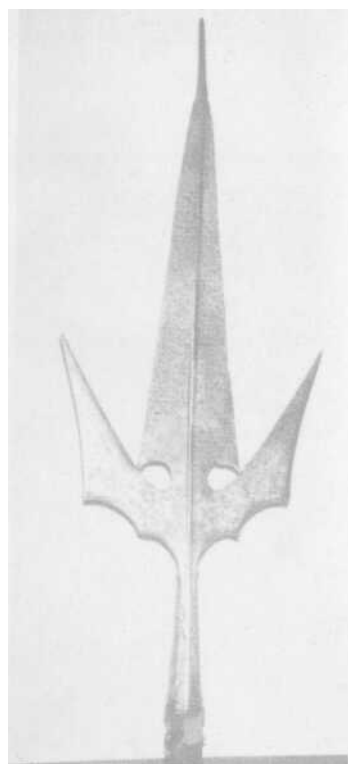


Fig. 31 Chauve souris (bat winged). An elaborate form of the runka with upward pointing sharpened wings. The central blade is 20 inches long from base to tip and the wings are 11 inches wide at the tips. Its use in combat would be limited by its tendency to become entangled.

PERCUSSION POLEARMS

"You warriors of God and His Law, Pray for God's help and believe in Him, So that with Him you will ever be victorious. You archers and lancers of knightly rank, Pikemen and flailsmen of the common people, Keep you all in mind the generous Lord You will all shout "At them, at them!" And feel the pride of a weapon in your hands, Crying "God is our Lord!"⁴

There can be no doubt that the club was one of man's earliest weapons. In one form or another it still exists today in the policeman's baton. The two handed version of the mace was the simplest of the percussion weapons. In most respects it was nothing more than a peasant's flail and continued

to be known as such. One handed weapons such as the mace, war hammer and *bee de corbin* were designed for use on horseback.

The peasant's agricultural flail was basically two thick sticks linked together used to beat a pile of harvested wheat as it lay on the ground, separating the wheat

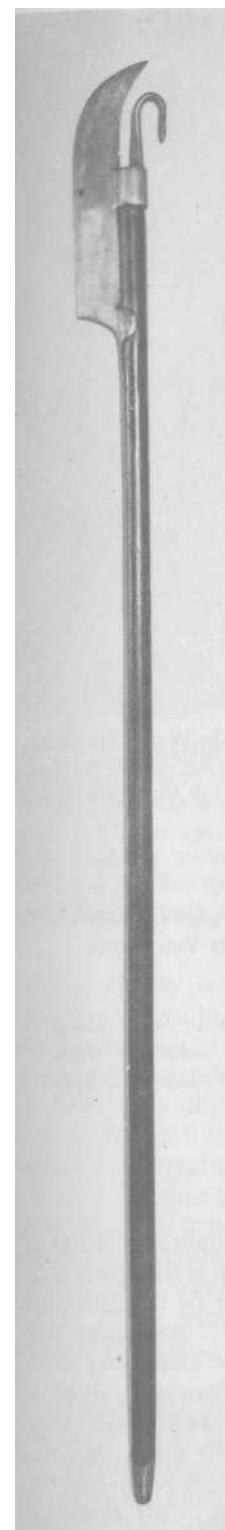


Fig. 32. Lochaber axe. A later version with the posterior facing hook. Earlier versions did not have the hook.

Fig. 33. Glaive. A weapon with the cutting edge on the convex side. This is actually a knife or sword-like blade mounted on a shaft. It differs from the military scythe in that the cutting edge is on the concave side of the scythe.

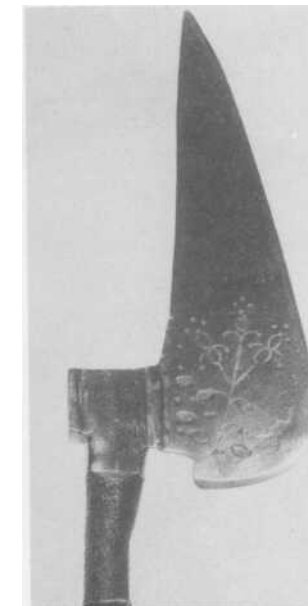


Fig. 34. Doloire. A two handed axe which was also called a wagoner's axe. The blade may be mounted at a slight angle to the socket. Engraving is present in this specimen.

grains from the stalks or chaff. The linking of the two sticks served to bring a greater striking surface to the wheat and it also increased the striking force.

Reinforcing the primitive flail with metal bands decreased the tendency of the wood to break and also increased its impact. The *military flail* (Fig. 35) had metal knobs or spikes added to the striking part. When the hinged striker is replaced with a knobbed or spiked wooden or metal ball and attached to the shaft with one or more chains it becomes a much more complex flail. This weapon, while difficult to master, it is also more difficult to defend against because of the flexibility of the chain. Flails were a principal weapon of Jan Ziska's Taborites in the Hussite Wars which took place at the beginning of the fifteenth century.

The *spiked club* (Fig. 36) was similar but without the mobile end. It is basically a two handed mace with additional refinements such as spikes. It usually had a spear type point to use as a thrusting weapon. This weapon was known by many names such as a "holy water sprinkler" or "morgenstern." The



Fig. 35. Flail. A sophisticated version of the agricultural flail. The ball is wooden with metal spikes inserted. While its flexible chain makes it more difficult to parry the weapon would seem to be harder to control.

"goedendag" is a Flemish term which probably refers to the same weapon. It was used at the battle of Courtrai in 1302 and has been variously described as a primitive halberd or a pike. William Guiart, a cross-bowman in the French army at the time described it as

Grans bastons pesans ferrez A un longfer

COMBINATION POLEARMS

Combination polearms are those which combine several functions and in this category the halberd takes precedence. The other weapons are similar to the halberd in function if not in appearance. Each combines at least two of the functions and they all have the capacity for thrusting and either cutting or percussion.

The English bill (Fig. 37, 38, 49) can be considered as the English halberd. The

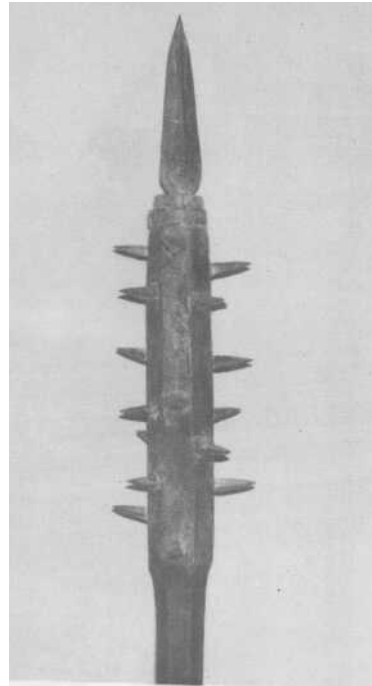


Fig. 36. Morgenstern (Holy Water Sprinkler, Godendag). This is a simpler version of the flail. It is an elaborate form of a club and much easier to control than the flail in.

agu devant. (Long heavy shafts reinforced with iron with a long sharp iron point)

and again:

Cil baton sont longs et traitis Pourferir a deux mains faitis. (The shafts are made long in order to permit swing with both hands).⁵

blade differs from the halberd as it has a pronounced forward curve at the upper end which accounts for either its name or the name of its agricultural counterpart the billhook. The shape of the blade may take different forms but the forward curve or hook to the blade is characteristic. The spear and the fluke may be round, square or flat in cross section. The shaft can be either round or octagonal. Most seem to



Fig. 37. The English bill is the English form of halberd. The slender spear and beak would not be of use against armor and the curved the blade may indicate its origin was the agricultural bill.

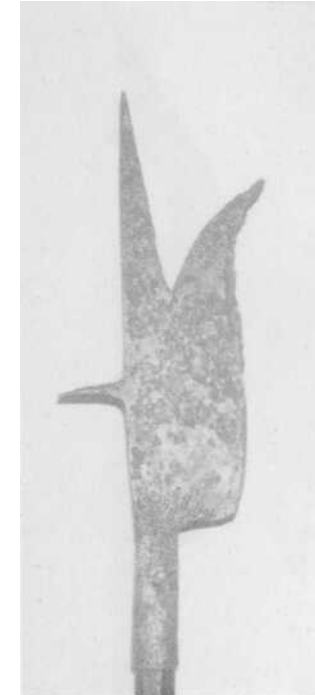


Fig. 38. English bill. An early version. It is more robust and therefore of better use against armor. This style seems to be designed as a weapon rather than as the adaptation of a tool.

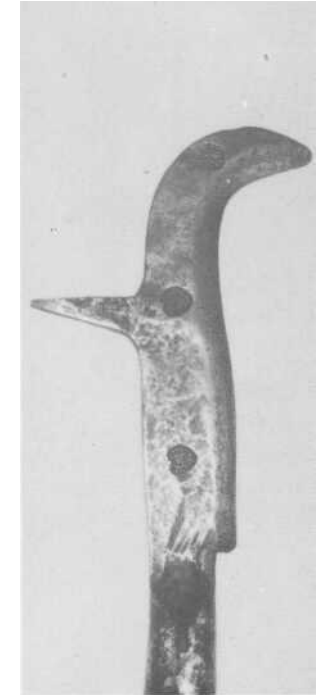


Fig. 39. Kriegsgertel. This weapon is more robust than the bill. It looks like a bill with the spear removed but there is no evidence of this. It has three unidentified armourer marks on the blade.

have a slightly conical socket and some have an unusual open space on the socket. The reason for this is obscure but it may have relationship to its agricultural ancestor. The major difference between the halberd and the bill lies in the weight. While probably as lethal to an unarmored man the bill does not have the weight or strength to strike through armor. Its spear and beak, while they might possibly be efficient against mail, would be of very little use against plate. Some bills also seem to be more fragile than their halberd counterparts.

A mid 16th century weapon which is known to some by the German name of *kriegsgertel* (Fig. 39, 56), looks like a type of bill that has lost its spear. Because of this close similarity it has also been

called a bill so it has been included in this section.

The Italian version of the bill is called the *roncone* (Fig. 40, 65). This weapon does not really look like a halberd at all, but it does have the same function viz. cutting, thrusting and piercing. The cutting edge is convex and appears to have been developed from the glaive rather than the axe. The spear and beak are not as pronounced as on the halberd. It has two small beaks projecting forwards and backwards at the lower end of the blade. Its use is more clearly indicated by its German name "rossschinder" and it would be the perfect shape to disable a horse. Its appearance could be as early as the 13th century.

The Lucerne Hammer (Fig. 42, 43, 58)

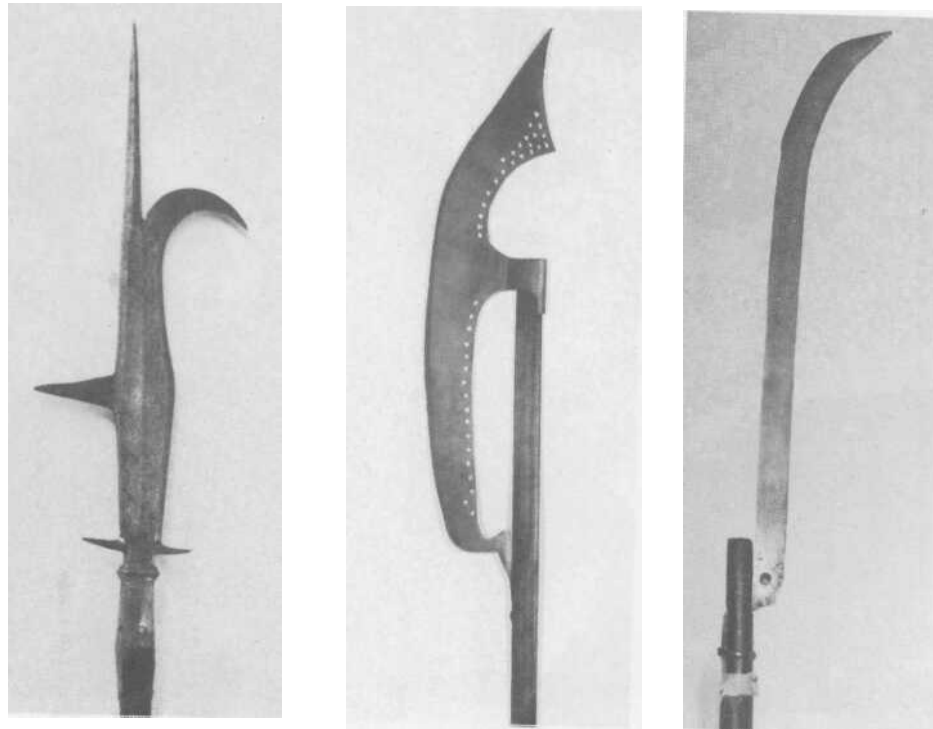


Fig. 40. Roncone (Italian bill, rosschinder). This is a much more sophisticated weapon than the bill, it does not have the weight of the halberd, and there are more piercing points. It is called a bill because of the upper curve of the blade. The German name (rosschinder) best describes its use (horse cutter) as it could easily hamstring a horse.

Fig. 41 The Bardiche is a cutting polearm with a long crescentic blade attached to the shaft by a socket at the lower end and in the mid point of the blade.

Fig. 42. Military Scythe. A scythe-like blade attached in line with the shaft with the cutting edge on the concave side. It differs from the agricultural scythe only in the angle of the tang and the blade.

is a variant of the halberd. It has a spear point and a pointed beak, but the axe blade of the halberd is replaced by a four pronged hammer. The prongs are prominent and are clearly meant for piercing rather than crushing. At the level of the beak and hammer, but at right angles to them are two short quadrangular lugs. It is a 15th to 17th century weapon and takes its name from Lucerne, Switzerland.

The poleaxe, (Fig. 44 & cover) another variant of the halberd, was popular with the knightly class for use in foot combat in the tournament (the lists). Its major use was "a

outrance" (serious combat) using sharpened weapons rather than "a plaisance" (friendly combat) in which blunted weapons were used and little harm done to an opponent and was probably an answer to sturdier armor. It had a spear point and an axe blade but the beak was replaced by a hammer with rudimentary knobs to serve as a crushing tool. They were frequently ornamented with brass inlays and they are heavier than the halberd with a shorter shaft, and might have a rondel for a hand guard. It appears in the first half of the 15th century and disappears shortly thereafter.

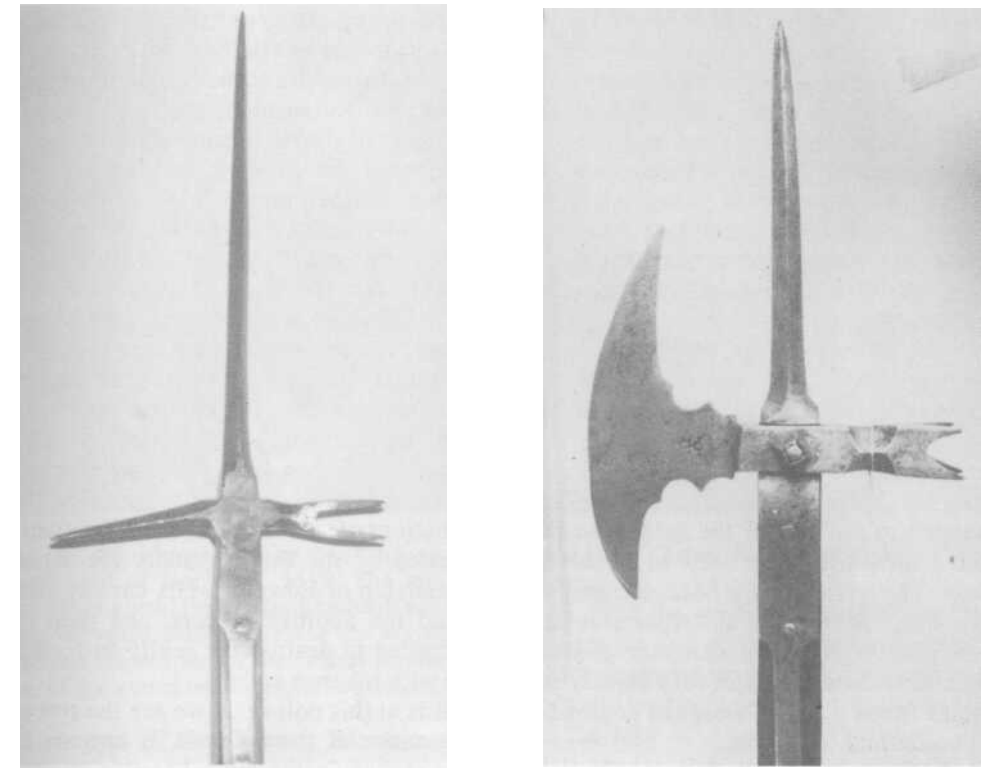


Fig. 43 Lucerne hammer. This weapon utilizes a four pronged hammer in place of the blade of the halberd. The shorter the points on the hammer the better it would be for crushing armor. The longer points would be better used against unarmored opponents. It appears in the 15th century and the soldier was usually placed in the middle of the Swiss phalanx along with the halberdiers. It seems to be a local favorite with the city of Lucerne and takes its name from that city.

Fig. 44. Pole axe with a four-prong beak. Another version had a hammer-like beak as seen on the cover. In either case it is sturdier and shorter than the halberd and can easily crush or pierce armor. Many poleaxes are engraved or otherwise decorated and were probably used in the tournaments.

USE OF THE HALBERD AND OTHER POLEARMS

Habebant quoque Switenses in manibus quedam instrumente occisionis gesa in vulgari illo appellata helmbartum valde terribilia, quibus adversarios firmissime armatos quasi cum novacula diviserunt et infrusta conciderunt (The Swiss had in their hands a terrible sort of weapon called a halberd with which they cut their heavily armored opponents to pieces as though with a razor).⁶

In the introduction it was stated that the polearm was a significant factor in the decline in the supremacy of the armored horseman on the battlefields of Europe. This happened gradually, but it must be

emphasized that no single weapon was responsible for the development. Several available weapons had to be used together as any single weapon had its particular weakness.

The long spear or pike as it was known in the 16th century had two separate periods of ascendancy. In the 4th century B.C., the Macedonians under Philip II took the short spear of the Greeks and lengthened it to approximately 18 feet. This weapon, the *sarissa*, when presented in serried ranks formed a nearly impenetrable hedge of points which the hoplite, the heavily armored Greek soldier, with his shorter spear could not disrupt.

An 18 foot spear which had to be handled with two hands precluded the conventional use of a shield. The Macedonians solved this problem by decreasing the size and weight of the Hoplite shield. It was hung by a strap around the neck and strapped to the arm of the soldier so that both hands could be used to wield the spear. The advance of a Macedonian phalanx must have been an impressive and terrifying sight. This compact phalanx when used in conjunction with cavalry and lighter forms of siege weapons dominated the battlefield of its time.

At Cynocephalae, in 197 BC, the more mobile Romans lured the ponderous Macedonian phalanx onto uneven ground, and attacked it from the flank. The Macedonians with the long sarissas were helpless when facing the Romans with their short stabbing swords. This open formation quickly dominated tactics, the phalanx formation was abandoned, and military affairs for the next few centuries were controlled by the Roman legions.

Their success was mainly due to their tight discipline in combat and on the march. This coupled with good generalship led to their continued success unless poor leadership such as that of Varus in the Teutoburgerwald intervened.⁷ At Adrianople, in 378 AD, the Roman legions were crushed by the Gothic armored horsemen ending the battlefield supremacy of the infantry for nearly the next 1000 years.

Armored cavalry in turn was not invincible. Terrain was certainly a factor, as mountainous country, bogs and forests restricted its movement. Missile weapons

such as the crossbow and the longbow were significant as well, but only in good weather. In the rain or in open fields unprotected by other weapons the archer was at the mercy of the horseman unless he could flee (as in the case of the steppe horse archer). Furthermore in close combat on foot, the archer was also at a disadvantage as the bow and crossbow are ineffectual hand to hand weapons.

In Scotland the long spear or pike appeared to be an established weapon as early as 1298 at Falkirk, and it had been seen in Wales even earlier. The Scottish spear was about 12 feet long; a length that could be handled with two hands or on occasion, even with one hand. At Falkirk in 1298 the formations of spearmen the *schiltrons* were defeated by the English under the astute generalship of Edward I. His cavalry first routed the Scottish archers, and then he proceeded to destroy the *schiltrons* formation with his own archers.

It is at this point that we see the rise in importance of the polearm. It appears to have started in the more agrarian rugged terrains where a fierce degree of independence coupled with relative lack of wealth prohibited the general use of armor. In Wales while spearmen were an important part of their levies, it is probable that the abundance of the yew tree favored the development of the archer. In Scotland and especially Switzerland, however, it was the polearm that appeared.

The pike rose to prominence as a result of two battles. At Courtrai in 1302 the Flemish burghers and peasants inflicted a crushing defeat on the French armored horse. At Bannockburn, (1314) the Scots maintained steady discipline in the ranks of pikemen, and with the judicious use of terrain and supporting cavalry and archers, successfully defeated the English army of Edward II. It must be stated, however, that in each case the ineptness of the attacking forces contributed to their defeat. The often overlooked factor at Bannockburn was that while the pikemen were used as a defensive wall at the start they were also used as an

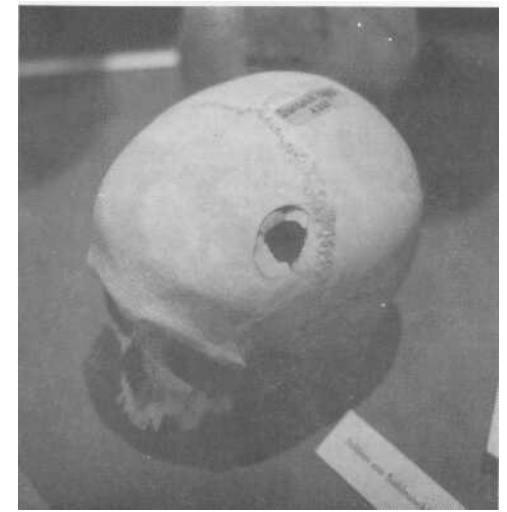
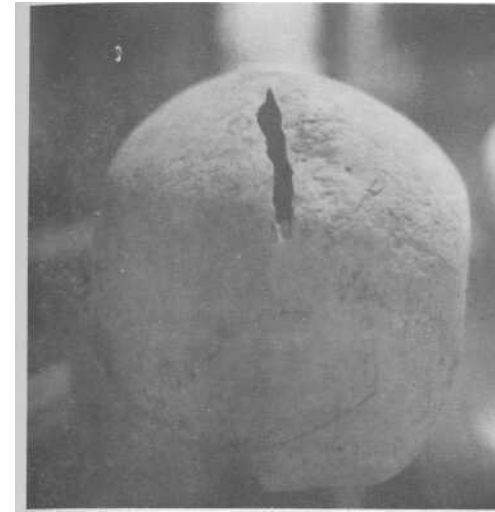


Fig. 45, 46. Human remains excavated on the battlefield of Doirnach, 1499. The are the wounds one would expect from halberds and two handed swords. While it could be that something else was responsible for the victims demise the size of the wound would suggest a polearm.

active part of the offense. Much in the manner of the Macedonians they drove the English knights deeper into the bogs where they perished.

It was in Switzerland that the polearm rose to especial prominence. At first it was the halberd that became the principal weapon. The axe-like blade on a five to six foot shaft coupled with the thrusting spear point and beak was a formidable weapon in the hands of a powerful mountaineer fighting on the rugged Swiss terrain. The relative isolation of the various Swiss cities and cantons led to a fierce loyalty to their village and a disinclination to suffer an outsider's interference. They had much opportunity to learn the use of their weapons in their internecine quarrels which naturally led to their resistance to Habsburg rule and eventually to the Forest Oath of 1291.⁸

The Swiss soon developed a reputation which led to the profession of soldiering as mercenaries called "Reisläufer." This was due to their ability to choose commanders on the basis of ability, their loyalty to their clan or village, their early training starting

around age 12 and their reputation for ruthlessness.

In 1315 the Austrians invaded the Forest Cantons and suffered a crushing defeat at Morgarten where they were caught on a mountain trail between the hills on one side and the lake of Aegeri on the other. The Austrians were either hacked to pieces by the halberds or pushed into the nearby lake. No quarter was given.

The success of these tactics resulted in the belief that the halberds were the essential part in the victory. At Laupen in 1339, Berne was opposed by Fribourg and Burgundy. The Bernese with the assistance of a force from the Forest Cantons were victorious. This success obscured the fact that the soldiers from the Forest Cantons were very hard pressed by the Burgundian knights and were saved by the Bernese who, after dispersing the Fribourg contingent, attacked the Burgundians in the flank. The battle increased the Swiss faith in the halberd and their contempt for armored cavalry.

The battle of Sempach in 1386 convinced the Swiss of the efficacy of the halberd which was rapidly becoming their second national weapon (the crossbow was the first). This campaign was the second large Austrian invasion and the Swiss met them on a hillside above the town of Sempach. As the terrain was unsuitable for cav-

airy the Austrian commander dismounted his knights confident that armored spear-men could defeat the halberd. In this he was nearly correct as the Austrians with their lances used as pikes were gradually pushing the Swiss off the field when the Swiss changed tactics to an assault against the Austrian flank. Aided by the sudden appearance of the delayed Uri contingent the Austrian ranks were penetrated.

When the Austrian pike line was broken, the halberds and two handed swords were free to perform their terrible work. Approximately 1800 Austrians were killed as compared to 200 Swiss, and Swiss independence was secured.

The subtle point of Sempach was missed, however, as the use of the spear or, as it was later known, the pike, was nearly successful. At Arbedo in 1422 a Swiss force was badly defeated when their dependence on the halberd could not prevail against an overwhelming force of dismounted knights using lances as pikes.

With this defeat as a lesson, the final form of the Swiss phalanx appeared. It utilized a two handed spear or pike which was approximately 16 feet in length. This was backed up with a force of halberdiers and *dopplesoldners* armed with two handed swords. Crossbowmen and handgunners were also used, but their slowness in reloading rendered them less effective in the Swiss style of fighting. The Swiss wore very little armor. The contingents formed up in the villages and marched in the battle formation that they would use. The result was that they were ready to fight as soon as they arrived and no time was lost in deployment. They were able to attack almost immediately and advanced at a fast pace.

Long pikes could be a problem on a long march. It was awkward and tiresome to carry upright. If carried on the shoulder the pressure and bouncing could create sore shoulders. The solution was to carry the pikes in a wagon until near the enemy.

It was these tactics that brought the polearm into prominence. The proper use of the pike and shorter weapons such as

halberds and two handed swords enabled the Swiss to dominate the battles of the 15th century. At Grandson, Morat, Nancy and Dornach the Swiss were supreme, but these formations were soon to be doomed by newer innovations and techniques. Artillery, sword and buckler, and the musket (envisioned as a longer pike) spelled the end of the Swiss phalanx. The Spanish general Gonsalvo de Cordoba developed the "tercio" with techniques of field fortifications to protect the camp, extensive use of the musket (arquebus) with fewer pikemen and the use of the sword and buckler at close quarters. These newer ideas were used at Ravenna (1512), Marignano (1515), Bicocca (1522) and Pavia (1525). The tercios were the formation of choice until Maurice of Nassau and Gustavus Adolphus of Sweden developed linear tactics in the late 16th and early 17th centuries.

The pike, however, continued to be used even with the appearance of firearms. The musketeer with the matchlock musket was at the mercy of the cavalry when he was in the process of reloading. This procedure took nearly a minute and a system had to be developed to protect him. The pike was still the only successful means of opposing cavalry in the field and pikemen continued to exist to nearly the end of the 17th century as a necessary adjunct to the musketeer. In fact in early 17th century armies the pike was considered the more complicated weapon and required the most training. Any new recruit could be adequately proficient in the use of the musket in a few weeks and as long as he did not blow himself or his neighbor up he could take his place in the line. The pike, however, required a soldier to be in good physical condition and to undergo exacting, precise and complicated drill instruction before becoming a valuable addition to the group.

The other polearms can be treated as being similar to the halberd but less efficient. None of them possess the weight of the axe head of the halberd. Some of the

piercing weapons while effective against unarmored men would not be of much use against armor (Lucerne hammer). Glaive type weapons have the same disadvantages, but are useful against horses and unarmored men (roncone, glaive, guisarme). The flails have some use against armor, but cannot be considered as efficient as cutting weapons against the foot soldier.

There have been questions raised in the past as to just how effective the halberd was. It has been portrayed by some as an awkward clumsy weapon which had little or no chance against the more agile swordsman and was useless against the armored horseman.

These statements need to be critically examined. The halberdier would be at a disadvantage against a single swordsman, but it was never designed for this use. Against the armored horseman, however, there is considerable historical evidence that it was very effective when used in a proper manner.

So impressed are the many witnesses to the use and effect of the halberd throughout its useful life (c.1315 to 1550) that one is forced to consider these accounts realistic, even allowing for the usual and expected exaggerations.

The eye witness accounts and realistic illustrations by artists such as Hans Holbein the Younger, Albrecht Altdorfer, and Urs Graf, show the effect of the halberd.

The account of the death of Charles the Bold who allegedly died, from the stroke of a halberd which cleaved his head to his chin, may be apocryphal. Even though the body was "half eaten by wolves" by the time it was discovered, the diagnosis would not have been different.

There are examples in the Zeughaus at Solothurn of skulls which were found at the site of the battlefield of Dornach (Swabian Wars, 1499), which demonstrate the terrible wounds that these victims suffered. These were probably from either halberds or two handed swords because of the deep

wounds inflicted. It should also be noted that these wounds were fatal as there is no evidence of healing. This may be contrasted with late 19th century skulls showing saber wounds against heads without the protection of helmets which show healing of the wounds indicating that they were not fatal.⁹

Schneider, in trying to test the effects of halberds, performed an experiment in 1928 in which his locksmith at the Landesmuseum, Zurich, after some practice, swung a halberd of about 1600 (sic!) fitted with a new ash shaft, against a munitions armor of the third quarter of the 16th century mounted on a dummy.¹⁰

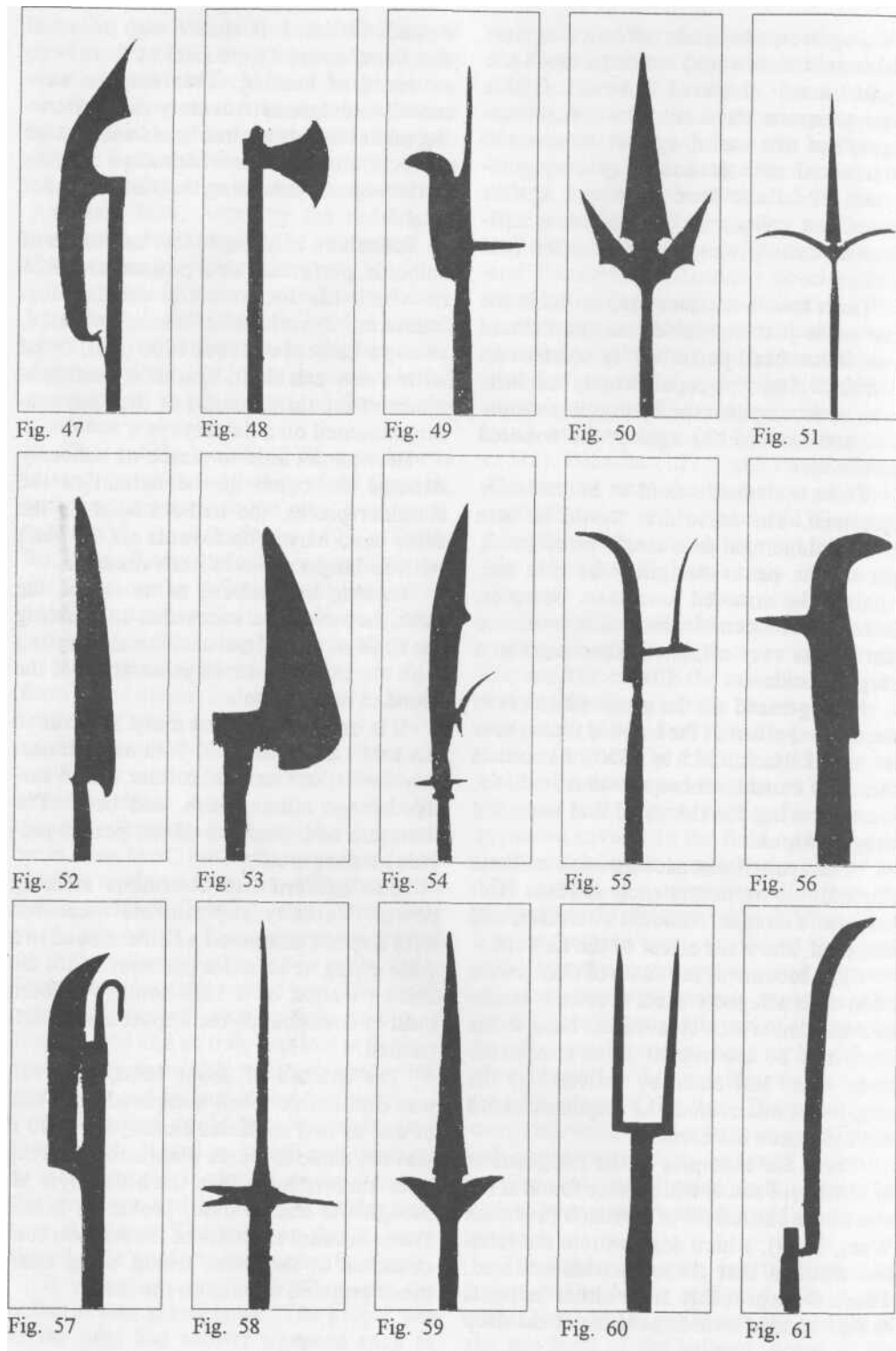
He was not able to pierce or seriously damage the comb of the helmet or the shoulder pieces, the halberd head on the other hand moved backwards off the shaft with its langet and was itself disabled.

Turning the halberd so as to use the beak, however, he succeeded in piercing the skull of the helmet easily and thrusting with the spike produced penetration of the rounded breastplate.

It is quite certain that early halberds in the hands of a practiced 14th or 15th century Swiss, or German, soldier would easily damage armor, flesh, and bone. The literature and graphics of the period provide ample proof.

The halberd had enormous striking power. Velocity experiments measured with a speed gun timed a halberd head in a wide swing at 12 miles per hour. With the known weight of a 15th century halberd head of four pounds the impact can be calculated.

The halberd of about 1600, however, was diminutive when compared with that of one or two centuries earlier. By 1600 it was not made to pierce plate armor, having a far smaller mass than the older style although the beak would, probably, pierce armor because the mass of the weapon concentrated at the point would bring enormous pressure to bear on the metal.



GLOSSARY

In probably no other field of arms history is the vocabulary so confusing as in the study of medieval arms and armor. This is due to many factors including language, personal bias, lack of communication, tradition, and sometimes pedantic obfuscation. This glossary makes no pretensions to being the only correct one. It is included to be of assistance to readers.

Ahlspiess — A polearm having a long needle like blade with a rondel hand guard. The blade is about as long as the shaft.

Bardiche (Berdysh) — A cutting type of polearm with a long crescentic blade attached to the shaft by a socket at the lower end and in the mid point of the blade. The blade extends beyond the shaft. It was a weapon of Russian infantry.

Beak — the rearward facing point on a halberd. Is sometimes called a fluke.

Bearded Axe. — An axe which has a straight or only slightly curved upper edge and a pronounced curve at the lower edge such that it appears to have a beard. It was an important weapon of the Vikings and of the Housecarles of Saxon England.

Bill — A British weapon which has several forms. It could be called a variant of the halberd. It has an axe like blade which terminated at the upper end in a forward curving sickle shaped point. It also has a thrusting point and may have a beak.

Celt — A paleolithic tool, a stone sharpened on one edge and used as a scraper or knife, and if held in the hand to strike anything it could be called a hand axe.

Chauve Souris (Bat winged) — A form of runka which has forward pointing wings of large size. The wings and the main blade are sharpened and have notches which give it an appearance of a bat's wings.

Corseque (Korseke, Spetum) A form of partisan with wings which curve backwards towards the butt of the weapon. The forward edges are sharp.

Couteau de Breche — An early form of cutting polearm which basically is a knife mounted

on a shaft. It has a convex cutting edge.

Doloire — A two handed axe originally probably a hewing axe. It is pointed at the top and round at the bottom looking something like a flattened teardrop. Also called a wagoners axe.

Dopplesoldners — Swiss soldiers who fought with two-handed swords. They received double pay because of hazardous duty. (Possibly hacking a path through the enemy's pikes).

Fauchard — see Glaive.

Flail — An agricultural tool devised for threshing grain by pounding it. It consisted of two heavy hinged pieces of wood. The military flail was bound with iron. Certain types had spiked wooden or iron balls attached to the staff with a chain. It was an important weapon of the Hussites.

Glaive (Fauchard) — A cutting polearm consisting of a long cutting convex blade which may have a small parrying hook on the back. It is the basic cutting polearm. The couteau de breche is an early glaive.

Godendag (Good Day) — a Flemish term for what may be a spiked club which also could have a spear point on the end. See Morgenstern, Holy Water Sprinkler. Opinions vary as to its precise appearance

Holy Water Sprinkler — see Morgenstern

Hoplite — A heavily armored Greek Infantryman.

Korseke — see corseque.

Landsknecht — German Mercenary soldier of the late 15th century.

Langets — Metal strips along the shaft of a polearm to reinforce the wood and protect

- | | | |
|-----------------------------|--------------------------|---------------------------|
| Fig. 47. Bardiche. | Fig. 54. Glaive. | Fig. 61. Military Scythe. |
| Fig. 48. Bearded Axe. | Fig. 55. Guisarme | Fig. 62. Ox Tongue. |
| Fig. 49. Bill. | Fig. 56. Kriegsgertel. | Fig. 63. Partisan. |
| Fig. 50. Chauve Souris. | Fig. 57. Lochaber Axe. | Fig. 64. Poleaxe. |
| Fig. 51. Corseque. | Fig. 58. Lucerne Hammer. | Fig. 65. Roncone |
| Fig. 52. Couteau de Breche. | Fig. 59. Lugged Spear. | Fig. 66. Runka. |
| Fig. 53. Doloire. | Fig. 60. Military Fork. | |

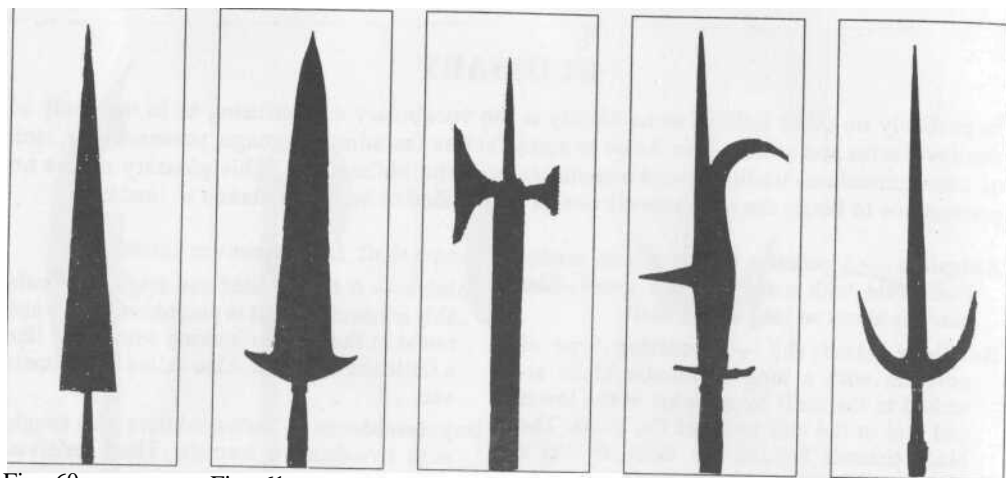


Fig. 60

Fig. 61

Fig. 62

Fig. 63

Fig. 64

the head from being cut off. The primary langets were extensions of the socket. Later two more were added which were not attached to the socket.

Lochaber Axe — A polearm with a long convex cutting edge which in later forms had a backwards facing hook at the upper end. The weapon is associated with Scotland.

Lucerne Hammer — A Swiss polearm that combined a spear point, a robust cylindrical beak and a hammer faced with four prongs. There might be pointed lugs at the base of the head at right angles to the hammer. It takes its name from the city of Lucerne.

Lugged Spear. — A thrusting spear with projecting lugs at the base of the blade to stop penetration.

Military Scythe — A primitive polearm consisting of mounting a scythe blade to a pole as an extension of the pole. It had a slightly concave blade with the cutting edge on the concave edge in contrast to the glaive which was on the convex edge.

Morgenstern (Godendag, Holy Water Sprinkler) — A club covered on the striking end with metal studs or more commonly with spikes giving it a star like appearance. It could also have a rudimentary spear point at its end.

Ox Tongue — (Langue de Boeuf) — A polearm with a broad thrusting blade

Partisan — A polearm with a broad triangular blade with projecting wings at the base. The wings gradually took on elaborate shapes (Chauve Souris) but by the mid 17th century

it gradually became smaller and emerged in the 18th century as an indicator of rank.

Phalanx — A close packed unit of soldiers. The Greeks used heavily armored infantry. The phalanx was improved by the Macedonians, but was superseded by the Roman open formation. It was revived in a modified manner by the Swiss in the 14th century.

Pike — An infantry spear designed for thrusting rather than throwing. In this time period it was usually 14 to 20 feet in length and in contrast to the partisan had a small head.

Poleaxe — A form of halberd in which the beak is usually replaced by a studded hammer. It is shorter in the shaft and heavier in the head than the halberd

Ranseur — see Runka

Reisläufer — A Swiss mercenary soldier.

Roncone (Rosschinder, Italian Bill) — A combination weapon which had a straight blade with a convex cutting edge, a spear point, and several beaks on both the back and front of the blade. It is used in the same manner as a halberd but in lacking the weight of the halberd it was of less use against armor.

Roschinder — The German word for the roncone. Means horse cutter.

Runka (Ranseur) — A polearm with projecting sharp wings at the base of the blade which curve towards the tip of the blade. It is in contrast to the corseque.

Schiltron — A Scottish version of the phalanx in which the soldiers are formed in a tight circle with pikes facing outward. Also called

a hedgehog. It is not as adaptable for offensive maneuvers as the phalanx.

Spear — The generic polearm consisting of a wooden shaft with an iron tip. It could be thrown (javelin) or held (pike, partisan).

Scorpion — Some writers have given the name to a polearm having a scorpion mark on the blade.

Spetum — see Corseque.

Wagoners axe — see Doloire

Zwinge — A collar placed around the base of the blade of polearms especially halberds. It was loose and served to strengthen the shaft. It also was a convenient location where a tassel could be attached.

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NOTES

John of Winterthur retelling the description by the King of Bohemia of the mercenaries of Claris in the army of Louis of Austria in 1330 near Colmar. This quotation, a translation from a Latin manuscript in the British Museum was written by a priest who accompanied the English on the Agincourt campaign. It was originally published in Sir Harris Nicholas' *History of the Battle of Agin-*

court, 1832. Quoted from *The Journal of The Society For Army Historical Research*, Vol XII, (1933), pp. 158-78.

Quotation from the translation of a manuscript in Latin by a priest who accompanied the British on the Agincourt campaign in 1415.

From a Taborite (Hussite) hymn "Ye Who Are God's Warriors." Peter Demetz, *Prague in Black*

- and Gold* New York: Hill & Wang, 1997. p.28; Tim Newark, *Medieval Warlords*. New York: Blandford Press, 1987, p. 115.
5. Delbruck, Hans. *History of the Art of War*. 4 vols. Translator Renfro, Walter J. Jr. Univ of Nebraska Press, Lincoln, 1982. p.437.
 6. In AD 9, three Roman legions under Publius Varus were destroyed in the Teutoburger Forest in north-west Germany. Although accounts are scanty they were apparently ambushed in a dense forest during a severe rainstorm and the fighting was nearly continuous over two days.
 7. Description of the battle of Morgarten (1315) by John of Winterthur written circa 1340 to 1348. His father was a participant in the battle.
 8. In 1291 three communities, Schwyz, Uri and Unterwalden, known as the "Forest Cantons," formed an alliance against Habsburg Austria. This "Everlasting League" gave rise to the Swiss Confederation.
 9. Donald J. Ortner and Walter G. J. Putschar, *Identification Of Pathological Conditions In Human Skeletal Remains*. Trauma, Fractures. Smithsonian Institution Press, Washington. 1985.
 10. Schneider, Hugo. Erfahrungen mit der Halbarte. *Schweitzer Waffen Magazin*. No 1, Nov 1982.

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PHOTO CREDITS

Altes Zeughaus, Solothurn, Switzerland: Fig. 6, 19, 29, 44, 45; The Castle Museum, York, England: Fig. 18; The Fischer Galleries, Lucerne, Switzerland; Cover, Fig. 63; Royal Armouries Museum, Leeds, England: Fig. 22, 46, 58, 65 (photos by the author reproduced by permission of the Trustees of the Armouries); Royal Ontario Museum, Toronto, Canada: Fig. 24, 32, 41, 56; Schweizerisches Landesmuseum, Zurich: Fig. 28; C. Keith Wilbur: Fig. 1.

Errata: Page 30, Fig. 60 to 64 — renumber as Fig. 62 to 66.