Evidence of weapons and equipment comes mainly from representations on painted pottery, sculpture, models of clay or bronze, and remains of the actual artifacts. Relatively little is known of the use of weapons and equipment before the middle of the 2nd millennium BCE, since such evidence comes largely from archaeological finds of the weapons or portrayals of weapons.

**Armor**

**Shields**

Before the Mycenaean period, little evidence exists for shields. In the Mycenaean period the most common type appears to have been the figure-of-eight shield. It is depicted in frescoes and other representations and is described by Homer. It had a vertical curved piece of wood, fastened to a horizontal curved piece of wood to form a cross-shaped frame with bowed arms. The figure-of-eight covering built over this frame was made of several layers of toughened bull's hide, then glued and stitched over a wickerwork layer. The rim of the shield was leather, and the horizontal bowed frame was reinforced with a wooden piece that also served as a grip. Homer also described a shield "like a tower." This probably refers to a semi-cylindrical shield with a curved convex top like the one portrayed on an inlaid dagger found at Mycenae. Or it may refer to a shield without the curved top, as portrayed in some frescoes. In either case, this shield was probably also constructed of leather stretched over a wooden frame.

Both types of Mycenaean shield were full-length body shields and appear to have had shoulder straps for support, so that both hands could wield a spear. The "tower" shield is much less common than the figure-of-eight in early portrayals of warriors. Small round shields appear to have been introduced later in the Mycenaean period, and representations of warriors show that a variety of other shield shapes were also used, such as elliptical and round shields with a segment cut from the bottom edge.

A shield developed from the figure-of-eight shape and a round shield with a central hand grip were both in use through the Dark Age. Bronze shield bosses that probably belonged to a type of round shield have been found. In the early 8th century BCE there were two main types of shield. The Dipylon type (named after a cemetery at Athens where representations of it were found) was oval in shape, with a scallop cut from each side. This shield was similar to the Mycenaean figure-of-eight shield and was probably a direct descendant. The other type of shield was round with a central hand grip. Two late examples of this type, dating to the early 7th century BCE, have been found at Delphi. They were made of beaten bronze, had central hand grips, and one had a pronounced central boss. These two Delphi shields were probably obsolete by the early 7th century BCE, since the Argive shield had been developed in the preceding century.

The Argive shield (hoplon, for which the hoplites were named) probably developed from an earlier type, as it was also a round shield, but it was much more convex and had a reinforced rim. Instead of a central hand grip, Argive shields had an arm band running vertically down the center and a hand grip near the rim, so that the shield could be supported by passing the forearm through the arm band and clasping the hand grip. These shields are shown in vase paintings from the mid-7th century BCE. Remains of these shields show that they varied from 31.5 in (0.8 m) to 39 in (1 m) in diameter. They were usually made of wood with an outer facing of bronze or ox hide and a bronze rim. The back of the shield had a thin leather lining and bronze fittings. Because the shield's wooden core was only about 0.2 in (5 mm) thick in the center, a bronze reinforcing plate was often mounted on the back of the shield to provide added protection for the forearm. Sometimes a leather curtain was hung from the bottom of the shield to protect the legs from missiles. The Argive shield continued to be used by hoplites well into the 4th century BCE.

With the increasing use of lightly armed troops against hoplites in the 4th century BCE, hoplite shields were sometimes made smaller and lighter. The Macedonian phalangite shield was also smaller and did not have the pronounced rim of the Argive shield. The phalangite shield was of wood faced with bronze, usually with an embossed design. It had an arm band and hand grip as on an Argive shield, but it also had a strap that passed around the neck. Experiments have shown that the shield could be supported and controlled using the arm band and neck strap, leaving both hands free to hold the sarissa, which was longer than a hoplite spear and required both hands to support it.
Lightly armed troops, such as peltasts, had lighter shields made of wickerwork, sometimes covered with goat or sheep skin or hide. Shields of Thracian peltasts were known as peltai (sing. pelte). Originally crescent (pelta) shaped, circular or oval pelta shields became much more common. The peltasts were named after their shields.

**Body Armor**

The earliest known suit of European armor was found in a tomb at Dendra, near Mycenae, and dates to shortly after 1400 BCE. It is plate armor, consisting of a bronze cuirass with a skirt of three articulated bronze plates in front and three behind. A separate neck piece and hinged shoulder plates completed the protection for the torso. While not as cumbersome as it appears, it would have required heavy internal padding and would have prevented the soldier standing up once he had fallen. A composite helmet with bronze cheekpieces protected the head. Remains of a pair of greaves and a single arm guard were also found with the armor. A few other pieces of bronze armor from this period are known, but it is unlikely that bronze armor was commonly used. Most armor at this time was probably leather, perhaps reinforced with bronze plates. Breastplates and greaves are mentioned by Homer, but apart from the Dendra armor, no examples of a Greek cuirass survive from earlier than the 8th century BCE.

An 8th-century bronze bell cuirass (so called because of its shape) was found in a grave in Argos. It is composed of front and back plates, which have simple decoration reflecting the anatomy of the upper torso. The two plates are held together by a series of catches along the sides and on the shoulders. A semicircular bronze plate (mitra) suspended from a belt could be used with this type of cuirass to protect the abdomen. The bell cuirass declined in popularity during the second half of the 6th century BCE. It was replaced by the linen cuirass, although the bronze cuirass continued to be used and evolved into the muscled cuirass.

There were two types of muscled cuirass: a short version, which finished at the waist, and a longer version, which covered the abdomen. The muscled cuirass was molded to reflect the muscles of the torso. It consisted of front and back plates, usually joined with catches at the sides and sometimes at the shoulders. In the 4th century BCE the longer version of the muscled cuirass was adapted for cavalry use. The muscled cuirass continued in use until the end of the Roman period.

Linen cuirasses are thought to have been used since the Mycenaean period and are mentioned in Homer's *Iliad*, but they became standard armor for hoplites only in the late 6th century BCE. The linen cuirass was made by gluing together many layers of linen to form a stiff vest about 2 in (5 mm) thick. It was wrapped around the body and tied together on the left-hand side, with another piece protecting the shoulders. Below the waist the cuirass was cut into vertical strips to allow movement. A second layer cut into similar strips (pteryges) was glued inside the first layer to cover the gaps. Linen cuirasses were cheaper and lighter than bronze cuirasses, although they were often reinforced by scales or plates. This type of armor remained in use until the introduction of mail armor in the 3rd century BCE. An iron cuirass discovered in the tomb of Philip II at Vergina is of the same general design as a linen cuirass.

Cuirasses of bronze and linen continued to be used into the Hellenistic period, but a much greater variation is shown in contemporary sculptures and paintings. Quilted linen cuirasses were also introduced. Linen cuirasses are shown covered with scales or overlapping rectangular plates (lamellar plates). In the 2nd century BCE Polybius mentions that wealthier Romans wore mail armor, and it was probably also used by some Greeks at this time.

**Leg and Arm Guards**

Examples of greaves (full-length protection for the lower legs) are known from the early 14th century BCE. Late Mycenaean artistic representations often show warriors apparently wearing greaves. A few bronze greaves of this date are known, and they are also mentioned in Homer's *Iliad*. However, greaves appear to have come into general use only in the 7th century BCE. The early types covered the leg from the ankle to just below the knee, but later examples were lengthened to cover the knee as well. The 7th- and 6th-century BCE types were often highly decorated, but later greaves were molded to reflect the leg muscles in the same way that muscled cuirasses were decorated. Greaves were usually pulled open and clipped onto the legs, but examples from Italy have attachment rings for straps to hold them in place.

Thigh guards are portrayed in contemporary art, but only one example has been found (at Olympia). Ankle guards, which covered both heel and ankle, were much more common, and they were tied on. There are also a few examples of foot guards, which were fitted to sandals to protect the toes and the part of the foot not protected by greaves and ankle guards.

All these bronze guards were lined with leather or fabric. Before the mid-6th century BCE the lining was rolled over the edge of the guard and stitched through holes in the bronze. This method of fixing the lining was also used on Mycenaean...
Helmets

A conical helmet made from pieces of boar's tusk on a base of leather strips, together with bronze cheekpieces, was found with the bronze armor from a tomb at Dendra, near Mycenae. The helmet dates to just after 1400 BCE. The same type of helmet appears in Mycenaean representations of warriors. Later pottery paintings show warriors wearing horned helmets and helmets with a spiky outline, perhaps representing hedgehog pelts. A helmet of the type found at Dendra is also described in Homer's *Iliad*, but the bronze helmets Homer mentions were probably worn mainly by the elite warriors. Ordinary soldiers probably wore leather helmets.

Later helmets show a pattern of development that appears to have evolved from two prototypes, the Kegelhelm and the primitive Corinthian helmet. There is much confusion and controversy over the naming of various types of helmets. Terms such as Attic and Illyrian, still used to identify helmet styles, can erroneously imply specific geographical origins.

The Kegelhelm (a German name meaning a "cone-shaped helmet" or "skittle-shaped helmet") is the earliest type of Iron Age helmet found in Greece. Dating to the 8th century BCE, it appears to have gone out of use by the 7th century BCE. Two types developed from the Kegelhelm: the Insular and Illyrian. The Insular dates to the 7th century BCE and is known from a fragmentary example and many miniature models, all from Crete. The Insular and Illyrian types were made in two halves that were riveted together, but the Illyrian, which also dates to the 7th century BCE, was being made in one piece by the first half of the 6th century BCE. Variations of the Illyrian remained in use into the 5th century BCE.

The Corinthian helmet was the most successful Greek helmet, undergoing a number of changes over a period of several centuries. It covered the head, leaving only the eyes, nose and mouth clear. The primitive Corinthian helmet dates to the 8th century BCE. The 7th-century versions of this helmet developed an indentation on the bottom edge, separating the neckline from the jawline. This feature is also found on early 6th-century BCE helmets, such as the Myros, apparently a very popular helmet as many examples have been found, including one with the name *Myros*. The cheekpieces of the Corinthian helmet were very flexible, so that the helmet could be pulled down over the head and still fit closely to the face. This also allowed the helmet to be pushed back on top of the head (where the grip of the cheekpieces held it in place), leaving the face and ears free when the soldier was not fighting. Variations of the Corinthian helmet were used in Greece until the early 5th century BCE, but the type continued in Italy, with very evolved forms surviving to the 1st century CE.

Both Illyrian and Corinthian helmets completely covered the ears, making hearing impossible. To alleviate this problem, the Chalcidian type of helmet was developed. This helmet is depicted in vase paintings from the early 6th century BCE and is characterized by a cutaway area around the ears that allowed the wearer to hear properly. Cheekpieces on Chalcidian helmets were either fixed or hinged. One variation of the helmet lacked a nose guard; this latter helmet is often called the Attic type and is known from Italy, with no examples from Greece.

The Thracian type of helmet developed independently of the Corinthian and Illyrian and was in use from the 5th century BCE. Thracian and Chalcidian helmets continued to be popular in the 4th century BCE, when they were often more decorated. A simple bell-type cap was also popular at this time. The Boeotian type of helmet, with only vestigial cheekpieces, provided good all-around vision. It was used by the Macedonian Companion Cavalry. In the Hellenistic period the Thracian type of helmet continued to be popular. However, there was now a much greater diversity of helmet styles, all more or less loosely based on previous helmet types, and often with the addition of new decorative features.

All bronze helmets were lined or worn over caps to provide padding that reduced the force of blows to the head. Early helmet linings were held in place by being rolled over the helmet's edges and stitched through holes in the metal, but later linings were glued in place.

Spears

Bronze spearheads with a partial socket (sometimes called a "shoeslot") were used in the First Palace Period. Spearheads with very long sockets into which the spear shaft fitted appear to have been introduced in the Second Palace Period. These spearheads were generally very long, ranging from 11.8 in (0.3 m) to 23.6 in (0.6 m). They were used on thrusting spears, although some smaller spearheads may also have been used on javelins. In the Third Palace Period "one-piece"
spearheads were used; they were about the same length as the long-socket type, but the one-piece spearhead incorporated the socket completely within the blade. Some were decorated and were obviously prestige weapons. Spearheads in use toward the end of the Third Palace Period were shorter, seldom over 9.8 in (0.25 m) in length, and with a definite socket. The trend toward smaller spearheads appears to have continued, resulting in a short, leaf-shaped spearhead. Both long and short spearheads were in use in the Postpalatial Period.

Homer refers to spears in the *Iliad*. Throwing spears (javelins) were usual, but some were obviously thrusting spears, such as Hector's, which was supposed to be 11 cubits long (about 18 ft, 5.5 m). According to Homer, spear shafts were made of ash wood.

In a Dark Age grave at Vergina, an iron spearhead and an iron spike on the butt of the shaft were found in situ, showing that the spear was about 7.5 ft (2.3 m) long. This is consistent with the estimated size of spears later portrayed in vase paintings, which appear to be between 6.6 ft (2 m) and 9.9 ft (3 m) long. Spears shown in vase paintings are leaf shaped, and many socketed iron spearheads of this type have been found. These spears sometimes had a socketed iron or bronze spike on the butt of the shaft; the use of socketed bronze spear butts had begun during the Mycenaean period. If the spearhead was broken off, the shaft and the spear butt could be used instead, and armor has been found that was apparently pierced by spear butts. The part of the shaft where the spear was held was bound with leather thonging to provide a secure grip. These thrusting spears were the main weapon of the hoplite, and changed little for several centuries.

In phalanx formation the spear was held in one hand in an overarm grip.

Throwing spears (javelins) were used by the lightly armed troops, such as peltasts, who supported the phalanx of hoplites. These spears were shorter and lighter, with smaller spearheads. A thong was often fixed to the spear shaft and twisted around it, and the loop at the end of the thong was held around the thrower's fingers. When the spear was thrown, the thong provided extra leverage and also caused the spear to spin in flight, giving it greater accuracy.

After the reforms of Philip II the phalangites of the Macedonian phalanx were armed with a long two-handed spear called a *sarissa*. Ancient sources disagree about its size. According to Theophrastus the longest *sarissa* was 12 cubits (ca. 18 ft, 5.4 m) long, but Polybius said they were 14 cubits (ca. 21 ft, 6.3 m) long and originally 16 cubits (ca. 24 ft, 7.2 m). The shaft of the *sarissa* was made of cornel wood (from the cornelian cherry tree). It may have been made in two pieces and joined with an iron sleeve. Such a sleeve has been found with the iron head and butt of a *sarissa* at Vergina. The name *sarissa* was also used for the smaller spears used by the Macedonian Companion Cavalry.

**Swords**

Swords always seem to have taken second place after spears. Bronze swords were used by the end of the First Palace Period. They had a long tapering bronze blade with a strengthening midrib and are usually classified as Type A swords. The sword hilt was joined to the blade by a short tang and a few rivets, which could not have provided a particularly strong joint. By the Second Palace Period these swords were a main part of a soldier's armament, and blades over 35.4 in (0.9 m) have been found, although the usual length was probably less than 27.5 in (0.7 m).

A Type B sword was developed, which had a larger, flanged tang and a broader base to the blade, providing a better method of joining it to the hilt. A fully developed Type B sword has not been found in Second Palace Period contexts on Crete itself, but was probably developed by mainland Mycenaean bronzesmiths.

In the Third Palace Period several types of swords were in use that are generally classified as Types C, D and G. The Type C sword had projections at the base of the blade to protect the hand, while the Type D sword was shorter and had shoulders at the base to protect the hand. The Type G sword was even shorter, but also had projections to protect the hand and a blade less tapered than previous swords.

Toward the end of the Third Palace Period, Types E and F short swords (or daggers) were in use, and at the very end of the period the European Type II sword (Naue Type II) was introduced. This was a longer sword that had a blade with parallel edges and a flanged hilt. It became the predominant sword type in the Postpalatial Period. Some Type II swords have hilts with ivory hilt plates and decorative gold bands. The Type II sword was in use at the very end of the Mycenaean period, and similar iron swords dated to the Dark Age show that the same style of sword continued, but was made of iron instead of bronze. A slashing weapon, it slowly evolved into a slightly shorter leaf-shaped slashing sword with a blade about 23.6 in (0.6 m) long. This became the normal hoplite sword, used only for fighting at close quarters or if the hoplite's spear broke.
In the 6th and 5th centuries BCE, a sword with a curved iron, single-edge blade (kopis) gradually appeared as an alternative to the hoplite sword. Early versions of this sword were slashing weapons, with blades about 25.5 in (0.65 m) long. They later evolved into shorter cut-and-thrust swords with blades about 17.7 in (0.45 m) long that were popular in Macedonia.

Daggers

Early bronze daggers are known from the Prepalatial Minoan Period. They were short, usually under 7.9 in (0.2 m) long, and may have been all-purpose knives as much as weapons. Hilts were attached by riveting them to the base of the blade; reriveted blades show that this was not always a strong method of attachment. The blades were strengthened by a central midrib. By the First Palace Period longer blades around 13.8 in (0.35 m) were in use, and by the Second Palace Period large daggers were being produced. It is often very difficult to distinguish a short sword from a long dagger. Toward the end of the Third Palace Period, short daggers (or swords) known as Types E and F were in use. As a weapon the dagger appears to have been totally eclipsed by the sword.

Daggers continued in use through the Dark Age and succeeding periods. After the Dark Age (if not before), they may have been regarded more as all-purpose knives than as weapons. Short swords or daggers were carried particularly by lightly armed troops such as slingers and archers, who would otherwise be unarmed when they had fired all their missiles.

Bows

Although bows were used throughout the Bronze Age, no examples from Greece have been found. Arrowheads were at first made from stone such as chert and obsidian, as in the preceding Neolithic period, but were later made from bronze, of which many examples have been found. Records of quantities of arrowheads and javelin heads in Linear B texts suggest that the use of missile weapons, including the bow and arrow, was a more important feature of early warfare than the evidence otherwise indicates. It has even been suggested that armor was developed to provide soldiers with protection from missiles rather than from spear thrusts. The evidence suggests that the Minoans used a composite bow, but the few early representations of Mycenaean bows appear to be the simple one-piece "stave" or "self" bows, which continued in use in Greece for many centuries. Evidence for bows and arrows dating to the Dark Age is sparse, except in Crete where finds of arrowheads show that they were used throughout that period.

At some stage the Cretans switched from the stave bow to the composite bow. Both Scythian and Cretan archers used composite bows made from wood, horn, bone and sinew. Bowstrings were of dried gut or sinew. The Cretan composite bow was a simple bow in the shape of a segment of a circle, whereas the Scythian bow was doubly convex. The Scythian bow was more powerful than the Cretan and had a range of over 480 ft (146 m). Vase paintings show that Scythian archers carried a bow and arrows in a composite case slung from a belt. Arrowheads were bronze and of various shapes, but Cretan arrowheads were generally larger and heavier than Scythian ones. Arrowheads were usually socketed so that the end of the arrow shaft fitted neatly to the head. Iron arrowheads may have been widely used, but few examples have survived.

Slings

Slings were made from (or from materials reinforced with) dried gut or sinew. One end of the sling was looped around the slinger's wrist, who held the other end in his hand, with the shot held in the loop of the sling. The sling was whirled around to give the sling shot momentum, and the end of the sling was released to launch the sling shot. Sling shots were made of stone, baked clay and lead. Thousands of lead sling shots or bullets have been found. They were cast in clay molds and were plum shaped, sometimes with motifs and short inscriptions on the surface as part of the casting, such as dēxa (take that). Lead shot generally weighed 0.7–1.7 oz (20–50 g), but much heavier weights were also used. Sling shots could not be seen in flight, and lead sling shots in particular could cause terrible wounds. Xenophon described how they could enter the body deep enough for the flesh to close over them.

A late Macedonian invention, around 170 BCE, was a short bolt or arrow called the cestrosphendone (Greek kestrōs). This had a short iron bolt head attached to a short wooden shaft with flights attached. It was thrown by a sling with two loops in order to hold the cestrosphendone securely. A sling mounted on a long pole was a late Macedonian invention and enabled ordinary soldiers to throw large stones.

Artillery
The earliest known piece of artillery is the *gastraphetes* (belly bow), which was invented in Syracuse ca. 400 BCE, possibly at the instigation of Dionysius I, tyrant of Syracuse. The *gastraphetes* was a very powerful composite bow, mounted on a stock with a draw and release mechanism. This mechanism had a slider on a ratchet with a claw and trigger. To operate the *gastraphetes*, the slider was pushed forward along the stock, and the claw hooked the bowstring. The front of the stock was then placed on the ground, and the operator leaned on the back of the stock, which had a specially shaped transverse piece of wood. The slider was pulled back over the teeth of the ratchet until the bowstring was taut, and the arrow was loaded onto the stock, against the bowstring. The weapon could be fired by pulling the trigger, which allowed the claw to pivot upwards, releasing the bowstring. The advantage of the *gastraphetes* over an ordinary bow was its greater power and range. Because of its weight and slow rate of fire, it was used mainly in siege warfare.

A more powerful mechanical bow, the *oxybeles* (bolt-shooter) was developed ca. 375 BCE. This used a winch to draw back the bowstring. Because of the extra weight involved in building a more robust and powerful machine, the *oxybeles* was fixed to a stand. The use of an even more powerful bow than that of the *gastraphetes* gave increased range and accuracy.

A later development of the *oxybeles* was to replace the composite bow with a pair of torsion springs. Each spring was made by twisting a bundle of sinew ropes, into which was inserted a bar. The torsion of the sinews provided the power, forcing the bar forward. The two springs were mounted symmetrically, so that the bars of the springs could act as the arms of the bow. A bowstring was fixed between them and drawn back to the firing position. The springs were then drawn tight by further twisting of the sinew ropes. The general name for this machine was *katapeltes* (pl. *katapeltau*, shield piercers), because some were capable of penetrating a soldier's shield and armor at ranges of more than 1,320 ft (402 m).

The bolts that were fired from an *oxybeles* or *katapeltes* varied according to the size of the machine. A common length was about 27 in (0.68 m). The heads of these bolts also varied, but they frequently had a triple fin or barb.

As *katapeltau* increased in size some were adapted to throw stones. Depending on their size these machines could throw stones of 10–180 lbs (4.5–82 kg). They were usually used in sieges to batter fortified walls, often at a range of 450–600 ft (157–185 m). Such a machine was called a *lithobolos* (literally, stone-thrower). A machine capable of throwing the larger stones was sometimes called a *petrobolos* (stone-thrower). The stones used in these machines were shaped into spheres to increase their accuracy, and several dumps of these stones have been found. Sometimes irregular stones were coated in clay to make them spherical, but this reduced their impact on the target.

**Siege Engines**

Before the mid-5th century BCE siege engines were apparently rarely used, although devices such as battering rams may have been used from earliest times. It has even been suggested that the "wooden horse" of Troy was in reality a battering ram protected by a wooden superstructure. The siege of Plataea (429–427 BCE) provides the first evidence of siege engines, with a battering ram being used. This and other tactics were unsuccessful, and the garrison had to be starved into submission. Dionysius I (tyrant of Syracuse, 405–367 BCE) offered large rewards for new inventions of siege engines and artillery. The resulting inventions revolutionized siege warfare, but they seem to have been regularly used only under Philip II of Macedonia (4th century BCE).

The "tortoise" type of battering ram was used for knocking down part of a wall. It was a beam of wood (the actual ram) mounted within a protective timber housing. The ram was either suspended so that it could swing back and forth or supported by rollers. The protective housing was mounted on wheels, so that it could be pushed into position, and the housing was covered with hide padded with seaweed. The front end of the ram had a bronze or iron head in order to cause maximum damage to the wall. The ram was operated by men inside the protective housing. They swung the ram back and forth manually or by a system of ropes and pulleys. A specialized form of ram was the drill, which knocked a hole in a wall, rather than shaking part of it down. The drill was a wooden beam with an iron point that moved on rollers within a wooden trough. The trough was mounted inside a protective housing, and the drill was moved back and forth by a system of ropes and pulleys attached to a windlass.

Siege towers provided the attackers with protected access to the top of a wall. Built of wood and covered with hides stuffed with wool or seaweed for protection, the towers were mounted on wheels so that they could be pushed up to the wall. Ladders or stairs inside the protective tower gave access to the top, and artillery and archers could fire from interior platforms. The towers sometimes had a drawbridge, which could be let down onto the wall being attacked. The Roman writer Vitruvius, quoting a lost work by Diades (an engineer that Alexander the Great took on his campaigns), gives the ideal dimensions of siege towers. The smallest one (10 floors) should be ca. 88.5 ft (27 m) high and ca. 24.5 ft (7.5 m)
wide at the base, with the top 20 percent narrower than the base. The largest one (20 floors) should be ca. 177 ft (54 m) high, ca. 34.5 ft (10.5 m) wide at the base, with the top 20 percent narrower than the base. The larger towers, with only slightly tapering sides, would have been very unstable.

In 307 BCE Demetrius I Poliorcetes (The Besieger) used a massive siege tower during his siege of Salamis. It was so large it was called the helepolis (literally, city destroyer). In his attempts to take Rhodes in 305–304 BCE, Demetrius built an even bigger helepolis, probably the largest siege tower constructed in ancient Greece. It was 130–140 ft (40–43 m) high and was built on a base 72 ft (22 m) square. The tower tapered upward and was about 29.5 ft (9 m) square at the top. It was mounted on wheels and had nine floors, all of which were armed with some kind of artillery—catapults on the lower floors and bolt throwers on the upper ones. It was built of wood, and all major joints were reinforced with iron plates. The front and sides were covered with iron plates to protect it from burning missiles, and it had ports at the front through which artillery could be fired. These ports were covered with shutters, which could be raised and lowered mechanically. The shutters were covered with hide stuffed with wool to protect against stone missiles.

At the siege of Delium in 424 BCE, the Thebans used fire-raisers against a palisade held by the Athenians. The fire-raiser was a cauldron of burning coal, sulphur and pitch attached to one end of a long wooden beam. The beam had been split and hollowed out, so that an iron tube could be fitted inside. The two halves were bound together, and the cauldron end was protected with iron plating. A bellows was fitted at the other end of the tube inside the beam to provide a forced draught to the fire in the cauldron. The beam was fixed to two wooden carts, so that the cauldron could be pushed up against the palisade. The bellows were operated at a distance to force flames from the cauldron to spread to the palisade.

Scaling ladders were frequently used in attempts to break into besieged fortifications, but they were vulnerable to attack by the defending forces. An improvement on simple ladders was the sambuca (sambuke), a ladder covered by a reinforced roof and sides for protection. It was mounted on a wheeled carriage by a horizontal pivot near the base of the ladder, so that the top of the ladder could be raised to the top of the wall being attacked. At the base of the ladder was a compartment filled with stones. This was used as a counterweight to the weight of the ladder and the soldiers (about 10) who climbed into the protected top of the ladder before the attack. The sambuca was wheeled up to the wall. Aided by the counterweight, the top of the sambuca was raised to the height of the wall by applying pressure to the vertical arms of a capstan on the end of the pivot to which the ladder was attached.

Various types of movable wooden shelters were used to protect soldiers when they were close to the walls of a besieged town, attempting to fill in ditches or undermine walls. Several shelters could be placed together to provide a protective passage to the wall or to siege engines close to the wall.

Casualties

Wounds must have been commonplace with the soldiers, though most information for treating wounds and diseases comes from later (Greco-Roman) non-military sources.

Further Information


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