Good day Worthy Knights

In this part 12 2 of 2, we concentrate on the manufacturing of the Gladius. (Wikipedia)

The gladius is about as short as arming swords get.

The spatha on the contrary was much longer, with its maximum length being about 85cm compared to the gladius' maximum length of 68cm. Because of this extra length, legionaries had far greater reach which is a huge factor in combat.

By the third century A.D., the spatha had essentially replaced the gladius as the weapon of legionaries. Keep in mind, by this time the legions took a step "backwards," going back to elliptical shields.

Cavalrymen favoured the spatha for its better slashing and cutting capabilities (the rounded tip). Romans also had been forced to "revive" cavalry at this time due to the barbarians with their German cavalrymen.

It is possible that the Romans saw that the spatha was very successful for cavalry and therefore began equipping en masse for their cavalrymen. Because of the reach as well, it could be better for defence, which is something the Romans wanted in the late empire as legions went from conquering to defending regions and frontiers.

The gladius was In service 4th century BCE through 2nd century CE, used by Legionary in Roman service, Roman-influenced other forces, Wars during the Roman Republic and Roman Empire

Specifications

Weight 1.2-1.6 kg

Length 64-81 cm

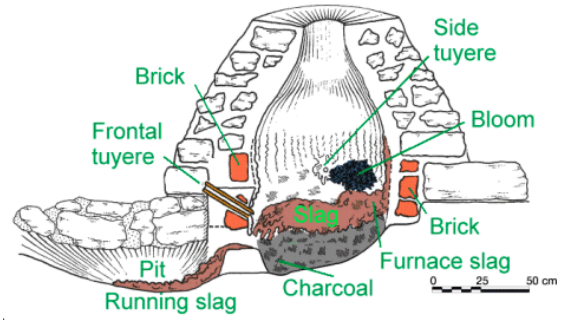
Width 4-8 cm blade type iron (sometimes partially carburized to near-steel), pointed, two-edged.

Manufacture

By the time of the Roman Republic, which flourished during the Iron Age, the classical world was well-acquainted with steel and the steel-making process. Pure iron is relatively soft, but pure iron is never found in nature. Natural iron ore contains various impurities in solid solution, which harden the reduced metal by producing irregular-shaped metallic crystals.

The Chalybes of the Caucasus region were metallurgists for Iron-Age Europe and they had found that increasing carbon content produced harder steel.

In Roman times ore was reduced in a bloomery furnace, as the blast furnace had not yet been invented, at least in western society. The temperature did not become high enough to actually melt the metal. The result was pieces of slag, or blooms, which were forged into the desired shape. Forging continued until the metal cooled (cold forging).



A recent metallurgical study of two Etrurian swords, one in the form of a Greek kopis from 7th century BCE Vetulonia, and one in the form of a gladius Hispanus from 3rd century BCE Chiusi, gives some insight concerning the manufacture of Roman swords.

The Chiusi sword comes from Romanized Etruria; thus, regardless of the names of the forms, the authors believe the process was continuous from the Etruscans to the Romans.

The Vetulonian sword was crafted by the pattern welding process from five blooms reduced at a temperature of 1163 °C. Five strips of varying carbon content were created.

A central core of the sword contained the highest: 0.15–0.25% carbon. On its edges were placed four strips of low-carbon steel, 0.05–0.07%, and the whole thing was welded together by forging on the pattern of hammer blows.

A blow increased the temperature sufficiently to produce a friction weld at that spot. Forging continued until the steel was cold, producing some central annealing. The sword was 58 cm long.

The Chiusian sword was created from a single bloom by forging from a temperature of 1237°C. The carbon content increased from 0.05–0.08% at the back side of the sword to 0.35–0.40% on the blade, from which one can assumed some form of carburization may have been used. The sword was 40 cm long and was characterized by a wasp-waist close to the hilt.

Roman swords continued to be forged both as composites and from single pieces. Any inclusions of sand and rust during the study would weaken the structure and no doubt limit the strength of swords.