11.2.3 Roman Swords

An Extremely Short Overview

- The "**Pax Romana**" (the "Roman peace"), lasted from about 27 BC to 180 AD. It was a time of relative peace and quiet for about 200 years in most of the area shown in color in the map below. The "Pax Americana" by comparison, has lasted about 65 years by now (with the USA actually being engaged in some war somewhere most of this time). The beginning of this blissful period is connected to the rise of power of **Augustus** the founder of the Roman Empire and its first Emperor. He ruled from 27 BC until his death in 14 AD.
  If you compare Augustus' empire to that around 300 BC you can see that the Romans did rely on the might of the sword to an astonishing degree.

The Roman Empire (colors) around 31 AD
Large map

Source: Wikipedia

- The empire was already rather large when Augustus started his term. During his reign it grew quite a bit and that didn't happen by gently persuading the various neighbors to come forward and sign up. Just consider the bit of unpleasantness that happened in Bethlehem around 0 AD and again in Jerusalem some 30 years later. Roman legionaries essentially conquered all the colored territories outside Italy and radiated enough power from the borders to keep the pink ones in line. The legions won the various battles for all kinds of reasons - but not because of superior swords.
  - I'm not saying that their swords were inferior. All I'm saying is that they were not very remarkable from a metallurgical point of view until about 200 AD - 300 AD when sophisticated pattern welded swords appeared. The team-work fighting style of legionaries, with fancy group maneuvers and so on, was probably far more remarkable and deadly to the undisciplined wielders of long and well-made swords. Here is a picture from the battle in Sagnlandet Lejre (probably taken with an extremely early Leica).

Roman legionaries
Large picture of the "turtle" formation

Source: Photographed at Sagnlandet Lejre in Denmark, an outdoor museum where Danes like to play Romans and Barbarians on weekends.

  - The legionaries are holding a short sword, the **gladius**, one of their standard-issue weapons used for centuries without much change in the general shape.

While most everybody in a legion was a pedestrian, the Romans also had a **cavalry** ("equites Romani"). In Augustus' time and later this was mostly a Roman **Auxilia** (literally "helpers") cavalry, recruited from non-citizens in occupied territories (called provinces) that had strong native cavalry traditions.
Here is a Danish auxilia training on casual Friday without the prescribed uniform:

Roman mounted auxilia, practising with his spatha

- As outlined before, a short sword is not optimal for fighting on horseback. Here you need the real thing: a long slashing kind of sword called a **spatha** by the Roman and everybody else. The picture illustrates what is quite clear anyway: If you fight from horseback you simply need a longer sword than a foot soldier.

As far as Roman swords are concerned I have given you a picture already. Before I go into details concerning gladius and spatha, it can't hurt, however, to have a quick look at the **pugio** too, the standard-issue Roman *dagger*. Here are a few examples:

Late Roman pugios
More pictures. And even more

Source: Archeology Museum Munich, Germany; From the "romancoins" Internet site

- Those pugios are from the late Roman period, 300 AD say. I appears that at least the two in the front have a pattern welded mid-rib with a fishbone pattern.
  These late pugios look pretty much like earlier ones. Romans were not great scientists, maybe, but they definitely were good engineers and heeded the first law of engineering [1)]. Pugios also look a lot like the Celtic show-off daggers so popular in the graves of nobles after swords disappeared as grave goods.

Gladius and Spatha

- Polybius and others Roman writers were making fun of the poor quality of Celtic swords, implying that the Roman ones were much better. A metallographic analysis should show if that really was the case, and what exactly the Roman metal workers could do better than the Celts. There is only one problem:

We do not have many gladii and spatha from the Roman military!

- However, we do have many Roman-made swords that were used by the Barbarians in the North and sacrificed by other Barbarians who defeated them. Fortunately, these guys pitched most of what they took from the dead enemy into a holy lake or bog, where some of the stuff was preserved exceedingly well until today. Typically, the swords are from the third and fourth century AD and most of them were pattern welded.
  - I will go into those and other pattern welded swords in great detail in the next sub-chapter. Here I only look at the Roman gladius and spatha as it was used by Romans typically before 200 AD.
- As pointed out before, a Roman legionary did not have an emotional attachment to his gear, in contrast to his barbarian or Teutonic opponent in the North-East. And even if he had, he couldn't take his trusty gladius into the grave with him. He had to give it back (in good condition) when he left the army - or else. We know from inscriptions that Roman swords had more than one (temporary) owner. I do believe (or rather hope) that modern armies tend to collect the M16s or Kalashnikovs too when some soldier is discharged; in millennia to come very few will be found in graves.
  - To give a number: In all of Great Britain, according to the BBC, altogether 8 spathae have been found so far. I do not have numbers for other countries and for the gladius but there just aren't many - while we have far more than 1000 Celtic long swords of the La Tène type. That means not only that there isn't much to investigate metallographically but also that museum curators will be even more reluctant than in normal cases to have these artifacts analyzed. It also means that we cannot have a good idea for what was typical. Even worse, there are indications that some of the gladii or spathae found were especially precious ones and therefore atypical. They might have been sacrificed by the winner and that's why we found them.
- Before I turn to the what little data there is, I will look a bit more closely at the objects of interest: the gladius and the spatha. First, let's be aware that Roman legions were running around for about 500 years in much of Europe. We must assume that the gladius of a guy in Spain might have differed somewhat from the one issued in Turkey at the same time, and that a 200 BC spatha was different from a 200 AD one. They also differ "somehow" from non-Roman swords but it is not always easy to put that into into words. Nevertheless, most of the time you know a gladius / spatha when you see one.
  - There are plenty of books and articles about the details. A few salient points concerning the **gladius** (taken from the article of Janet Lang [2]) are:

    - The *name* "gladius" in Latin simply means sword. It is believed to be a Celtic loanword derived from ancient Celtic "kladi(b)os" or "kladimos"=sword. A gladiator is a swordsman and a gladiolus is a plant with sword-like leaves.
    - *History:* During the conquest of Spain in the 3rd century BC the Romans supposedly encountered the Gladius Hispaniensis or "Spanish Sword", took over the design and kept it for 600 years or so.
    - *Length:* Somewhere between 590 mm and 367 mm. Most, however, come with lengths between 380 mm and 430 mm and there is a good reason for this "shortness": it is the practical length for easy drawing if you only have one hand for doing this! As a right-hander you then draw your sword with only the *right* hand from a scabbard on the *right* side of the body. You need to do this because your left hand holds your big shield. A long sword typically hangs on your left side and you must hold the scabbard with your *left* hand while you draw it out with your right hand.
    - *Shape:* Two basic shapes are distinguished. The so-called Mainz type, in use before the middle of the first century AD, and the Pompeii type after that. The Mainz type had a short, slightly waisted blade about 500 mm long and and a long point, the Pompeii type had parallel edges and the typical triangular tip. It was relatively short (45–50 cm) but "grew" in length as time progressed until it became a spatha.
    - There is no clear distinction between a gladius and a spatha. Swords 770 mm long have been described as gladius although with this length it should be rightfully a spatha.

Here are a few gladii of the two basic types:

Mainz type Gladii

Source: From the "Roma Victrix" Internet site. The top on is in the Zagreb museum (Republic of Croatia) the other two are from private collections

Pompeii type Gladii

Source: Left: Guttmann collection; from the site of Bill Blake. Right: Photographed in the Nijmegem museum, Holland

Now a few words to the Roman **spatha**. The "Roman" is important because the term "spatha" is used by many as the general term for any straight double-edged sword. There is no clear distinction from a gladius. As a practical matter one can take the length: A Roman sword longer than about 75 cm we call a spatha.

Spatha in Latin means sword, just as gladius. It probably goes back to the ancient Greek "spathi", a term for a wooden blade or paddle. The spade you use for digging (German; Spaten) is language-wise a close relative of the sword. Espada means sword in modern Portuguese and Spanish; the French, as always, mutilated it to épée.
The term "spatha" for sword was introduced by Tacitus (ca. 56 AD – after 117 AD). He used it to distinguish the long swords of the (unidentified; possibly Celtic or Germanic) mercenaries (called "auxilia" or auxiliaries) from the gladii of the legionaries during the chastising of the rebellious British king Caractacus.
Here are some spathae:

Roman spathae

Source: Top: Herford museum, 200 AD - 300 AD. Middle: Wikipedia. Bottom, Shrewsbury museum.

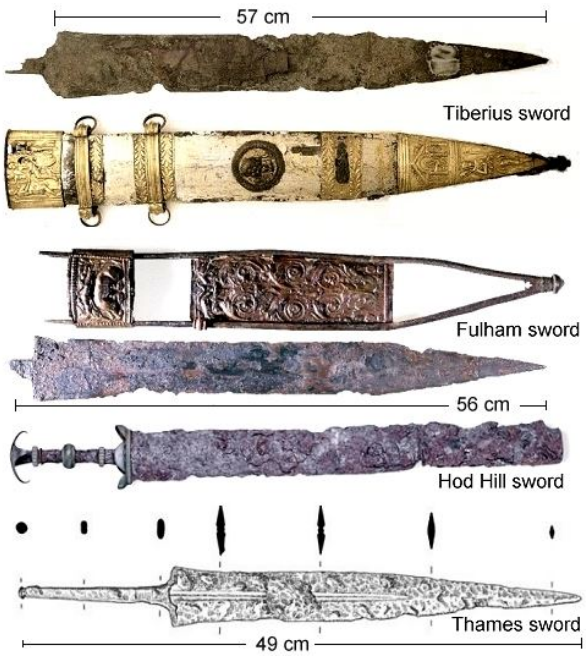
The spatha probably came to the Romans via their Celtic mounted "auxilia", the hired Celtic cavalry, in the early imperial period. Eventually, sort of in the second half of the 2nd century AD, the spatha started to crowd out the gladius. That might be due to the increasing importance of the cavalry and a general change of military tactics. In a parallel development the sword was carried increasingly on the left side and pattern welded swords appear.

The Metallurgy of Roman Swords

What do we know about the metallurgy of Roman swords (before, let's say, 200 AD)? Not all that much. Janet Lang's study [2)] from 1988 is still the standard; a newer study on Roman armor [3)] tends to confirm her findings. There are a few studies of isolated objects before 1988; the result are covered in Janet Lang's paper.

Janet investigated five Roman swords from the British museum and one from Chichester; below are pictures for 4 of them. They are:

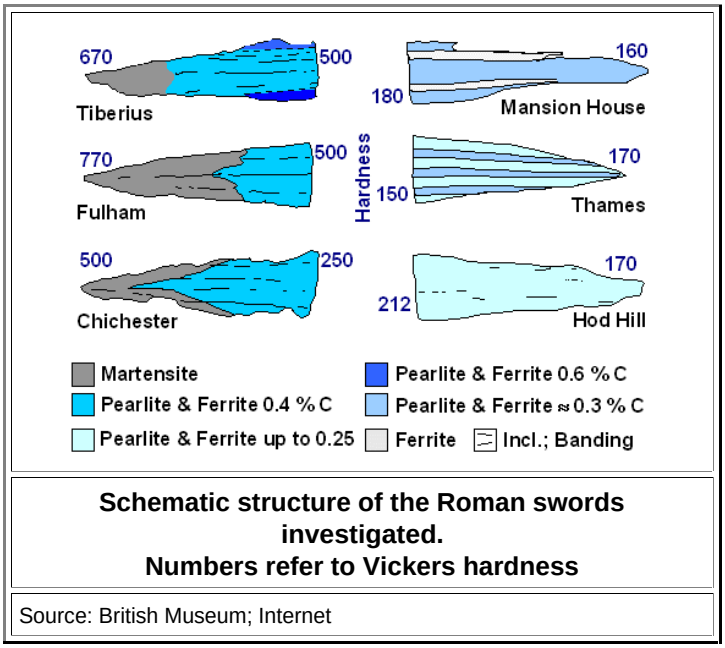
- The sword of Tiberius. First half of the first century AD.
- The Fulham sword. First half of the first century AD
- Sword found in the Thames. First to second century AD
- Sword found near the Mansion House, London. Late first century AD
- Sword from Hod Hill. Mid to late first century AD
- Sword from Chichester. First half of the first century AD



Some of the swords investigated

Source: British Museum; Internet

A schematic summary of the findings almost tells it all:



Schematic structure of the Roman swords investigated.
Numbers refer to Vickers hardness

Source: British Museum; Internet

What we have, in short, is:

- Five different structures for six swords. From rather bad to perfect.
- Compositional piling is definitely used.
- Hardening by quenching is definitely used.

Going a bit into detail we learn:

- The Fulham and Chichester sword might have been made without piling from one solid piece of steel. It is, however, just as likely that traces of piling were obliterated by forging.
- The three swords on the right were definitely made by essentially piling wrought iron.
- The Tiberius sword was made by piling hard steel to the outside of softer steel.
- The swords on the left were quenched and possibly tempered. Tempering could have been done intentionally or by a quench short enough to leave the inside still hot, heating up and thus tempering the outside somewhat after withdrawal from the quenching medium.
- The smith making the Tiberius blade made the edge by filing / grinding, removing the outside layer of hard steel in the edge region. That doesn't make much sense.
- The somewhat earlier swords (before about 50 AD) are better than the later ones.

Janet Lang goes into some length to discuss these results. Six swords do not allow to extrapolate on other swords, however, so we cannot learn anything about trends and so on.
One sword however, is already enough for one *major conclusion*:

Around 50 AD, at least one smith in the Roman empire knew everything needed to make complex composite swords

Here he is. An authentic Roman smith with his helpers, as shown in an amazing picture from a house in **Pompeii** and thus dating to - roughly - 50 AD.

Roman smith

Source: Photographed in the Archeological Museum Naples, 2018

- This is a picture from Pompeii, showing a smith at work. Pompeii went down the drain (so to speak) at 79 AD, so the time is about right. The picture (besides being a masterpiece of composition etc.) shows the main ingredients needed to make complex composite sword: knowledgable assistants (nowadays known as grad students). I'm not sure why they need to be naked.

We also know from looking at the production of Roman iron that this was a highly organized activity. The quality was not much better that that of the non-Romans, but the quantity increased substantially, and everything was standardized. Look at those iron bars found in the Rhone ship wrecks to get an idea. We might assume that the military industrial complex that made all the weaponry and so on, was just as organized. It is quite possible that standard equipment including swords was not made at a top quality level but only up to meeting specifications (including costs, maybe). However, without a sufficient number of specimens, this is just speculation.

All things considered, the Romans did quite well with their swords for several centuries. The Barbarians overthrowing the Roman empire eventually did just as well or better. Their swords were straight and double edged and thus related to the spatha. And they were pattern-welded and at least earlier in the first half of the second millennium acquired in one way or another from Roman sources. This leads us almost straight to our next topic, pattern welding.
Before I go into this, however, we need to give a quick glance to more "Roman swords:

Swords of the Byzantine Empire

In the West we always learn that the Roman Empire collapsed on at 476 AD. This is not quite correct, however: it was only the Western part of the Roman empire that came down for good. The Eastern part survived for almost 1000 years, until 1453 and became known as **Byzantine Empire**. It not only survived, it was the most powerful economic, cultural, and military force in Europe during most of its time.

- Constantine I (324–337), who reorganized the full empire, made Constantinople (=Byzanz=Istanbul) the new capital of the empire *and* legalized Christianity. Sultan Mehmed the Conqueror finally took the city (and the empire), after a 53-day siege that had begun on 6 April 1453. Constantinople's "invincible" walls were breached by the early (first?) use of cannons.

So what did the Byzantine empire give us in terms of iron and steel technology?

- *Nothing*, it appears. At least I could not find anything written or shown in museums. I did not search very hard, though, but I doubt there is much to discover. I have found nothing at all in the museums in Istanbul. The Byzantines probably just carried on what they had and did not add anything worth to note.
  That goes with their achievements in almost all other "disciplines" you care to mention: Philosophy, literature, music, art, ship building, general technology, whatever - except, perhaps, architecture. The built the **Hagia Sophia** , after all, around 535, and this building is still a site to behold. They also were fanatic about mosaics but that gets rather boring long before thousand years have passed.

---

1) **First law of engineering**: If it ain't broken, don't fix it.

2) Janet Lang: "Study of the Metallography of some Roman Swords", Britannia, Vol. 19 (1988) pp 199 - 216

3) Michael Fulforda, David Sim, Alistair Doig, Jon Painter: "In defence of Rome: a metallographic investigation of Roman ferrous armour from Northern Britain", Journal of Archaeological Science, Volume 32 (2005) pp 241 – 250.