DEVELOPMENT AND USES OF ARMOR

By Leonard Heinrich
Metropolitan Museum of Art

You fellow Collectors and members of the American Society of Arms Collectors know more about guns than I do, therefore I will talk about armor, my profession and hobby. I will try to give you a short history of armor, the making and wearing of it and to disprove some of the fallacies.

I will eliminate Greek, Roman and other bronze armour which would lead us too far afield and I will start on Medieval Europe.

Contrary to what the movies and television leads us to believe the legendary King Arthur had full armor, he did not, he merely wore a helmet and this was also true for the Knights of the Round Table. The helmets were made of segments of iron and other materials held together by metal strips. Charlemagne also wore this type of helmet and it's origin was in the orient and was brought to Europe by the Vikings who invaded the orient.

During the Crusades chainmail armor was worn over a padded coat. Imagine how warm this must have been in the Near East. Some of these chainmail coats had as many as 200,00 to 250,000 small links all riveted individually by hand. These coats were mass produced even in those days, one person made the rings, another punched the holes for the rivets, one linked it in and another put the rivet in. Just remember those links would average about 1/4 inch each. The helmets were made of small iron plates riveted together as only small pieces of metal were available. All iron sheets were made by hand as there were no rolling mills in those days. The helmets were flat topped and are called the Topf or Pot Helmet today as it resembles a pot. In many cases the front ridge and the eyeslot of the Crusaders helmet formed a cross. Underneath this helmet they wore a small scull cap and this cap protected their heads while they were not in battle and their helmet was hung over their saddle. They put on the helmet when they went into battle.

Norman warriors wore long coats, sometimes below their knees, of scale armor rivited to linen. The scales were of iron or hard boiled leather. The boiling toughened the leather. Such armor is shown in the famous Bayeaux tapestry and sometimes it took two men to carry a suit of armor and put it on another one. Once it is on the person the weight is distributed and the wearer can move around.

The earliest plate armor appeared in the 13th Century. First plates to cover selected parts of the anatomy were laced to the chainmail or leather coat. By the 14th Century full suits of armor appeared which we call Brigandine which was made of small plates riveted to leather, linen or velvet and of course these were quite flexible but they did not protect the men as well as some of the others as the plates could turn and let the arrow go through. Others were polished bright and covered the man from head to foot. The helmet still retained it's conical shape until about 1400 which was 600 years of that type of helmet. After 1400 the point of the helmet was gradually lowered and it became the Sallet or Salade. The German World War I helmet was designed from one of these salades.

Full suits were worn until about 1600 and after that three-quarter suits. The shape of armor always followed the style of clothing, it imitated even the slashings and pipings in metal. The pointed shoes of the earlier times gave away to the broad toes, called bearpaws, by the 1500s. Due to the improvement of firearms armor had to be made thicker and therefore heavier and finally was discarded piece by piece and only the helmet, brest and backplates lasted to the end of the 17th Century. Armor came to it's final end when it no longer gave protection against firearms.

Today, we have armor again, and very good protective armor. It is made of layers of Nylon overlaid with thin aluminum plates. We proved that the flack suits for the aviators would stop a .30 caliber rifle bullet. We also made an infantry helmet that unfortunately was not adopted that would also stop the .30 caliber bullet. This was a two piece helmet because the army wanted a two piecehelmet for washing and the Nylon liner alone is better than the steel helmet as far as protection is concerned. We also made the Korean infantry jacket in two models and it was much lighter than the flying jacket because the man on foot couldn't carry the 30 or 40 pound jacket. In one month they had them in Korea and they proved very successful. It was noted that the heavily padded coats of the Chinese Reds stopped the shrapnel splinters.

Now as to the making of armor. The first helmets and armor were made of iron as steel was not yet know. Swords were made of laminated iron to make them stiff yet flexible. Any iron obtainable that was known to be harder was welded on to the edge of the blade to hold it's harpness. There are many of these swords in existance today and the welding pattern of the lamination is visible in a large number of them.

About 1350 temperable steel appeared then the armorer bought his metal from the hammermill where the iron and steel was welded together for him. The armorer then shaped his plates with the steel on the outside by forging, first red hot, then finishing by cold hammering. We have come across some armor pieces where the armorer made a mistake and had the steel on the inside and the iron on the outside. Of course this armor is inferior.

After the armor was finished and fitted together it was then taken apart and tempered by heating and chilling in water and the steel became glass hard and the iron soft. Finally it was polished to a mirror like finish. This tempering gave a hard surface outside for protection against the weapons and the soft iron inside kept the metal from shattering or denting.

By the end of the 16th Century armor was no longer made as carefully, by then it was mass produced. As the armor was used mostly for dress affairs and parades, the foot soldiers doing the fighting, more attention was paid to decoration than to the quality of the piece. Even those suits that were used for battle were etched and gilded. Parade armor was embossed, jewelled and damscened. Later armor was predominantly blued and blackened to subdue reflections and protect against rust. Even earlier armor was at times painted with the coat of arms or the colors of the wearer. Very vew pieces came down to our times with this painting still present.

As to the wearing and other facts about armor. A full suit of armor was always tailor-made to measurements. Several fittings were made before it was finished for delivery. Every joint fitted perfectly and the wearer could move freely, more so than a modern football player. A person could put on a full suit of armor in about ten minutes, without help however we do know that the Knights had their squires and pages to help.

The sequence of dressing was, legs first by stepping into the sollerets, as the shoes are called, then closing the entire leg, fastening the top to the belt. Next the collar, then the breast and backplates were slipped over the head and fastened around the waist with a belt or hasps. Then the sleeves were buckled to the collar. The collar bearing the weight of the breast, back and sleeves. The helmet was next, then the gauntlets, as the gloves are called were last. He is now ready to mount his horse. Contrary to common belief that armor is clumsy and stiff it is very flexible. I wore a suit of armor in the Metropolitan for four hours without any discomfort, getting up and sitting down, walking up and down stairs, fencing and other activities. This belief is probably due to the fact that some old suits were re-strapped and re-rivetted wrongly in recent times leaving them stiffer than normal.

The weight is also frequently thought to be a hindrance. A 15th Centruy battle armor weighs about 45 to 65 pounds and the Knight was on horseback. Today's modern soldier carries more than this when he goes into battle. The foot soldier's armor of olden times weighed from 20 to 25 pounds. Of course by the 17th Centruy it became heavier and and therefore was discarded. There were suits made much heavier for tilting and jousting in tournaments. They were made thicker to protect the wearer against injury during the contest. Some of these suits weighed up to 100 pounds but they were worn only for a short time during the contest.

How did they get on their horse, just in the normal way, put their foot in the stirrup, throw their leg up over and get on. Definitely not with a hoist as shown in the movies. Only in jousting did a man climb into a saddle from something like a carriage mount. After he was on the horse the helmet was bolted on because as a rule it weighed from 25 to 30 pounds.

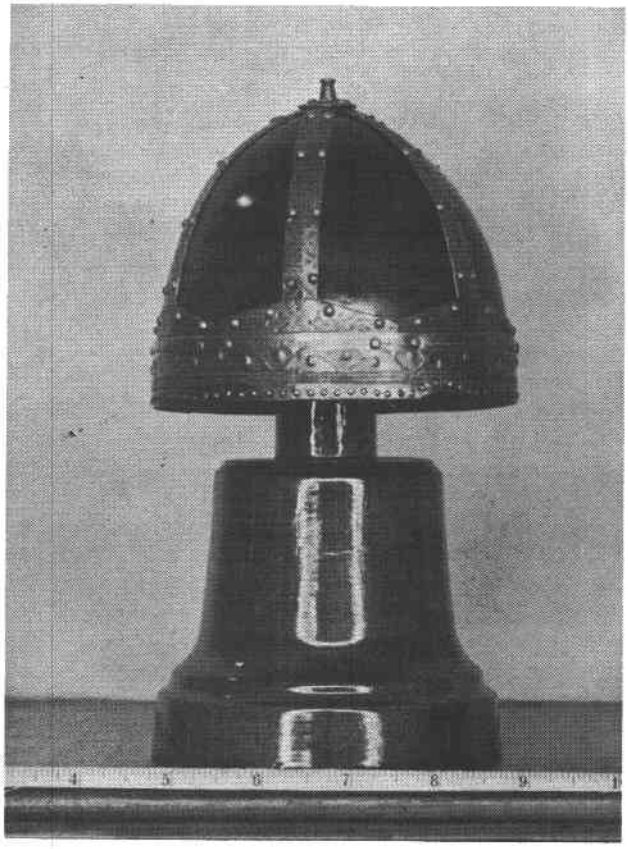
The armorers were controlled by their guilds that were located in many of the cities. If they turned out inferior armor it was rejected, all armor was inspected by the Guild Masters. All imported armor likewise had to be inspected and passed. The original papers of the Guild Laws are still in existance in Vienna, Augsburg and Nuremberg. The early armor making centers were Milam and Florence in Italy. Then Innsbruck in Austria followed by Augsburg and Nuremburg in Germany. In the 16th Century in Greenwich, England. This later armory is said to have been founded by Henry VIII. There were other armor making places but they turned out armor in smaller quantities and in many cases of inferior quality. In many cases the armor had to bear the stamp of the armorer and the city's approval stamp.

The so called Spanish armor worn by the men of Columbus, DeSoto, Cortez and others was practically all made in Italy or Germany. The true Spanish armor was made by the Moors in Spain in the 15th Century but as they were disfranchised for religious reasons this practically stopped the manufacture of Spanish armor. The making of Spanish armor today in Spain for the benefit of the tourist and for export trade is a thriving business, this also includes fancy swords and daggers.

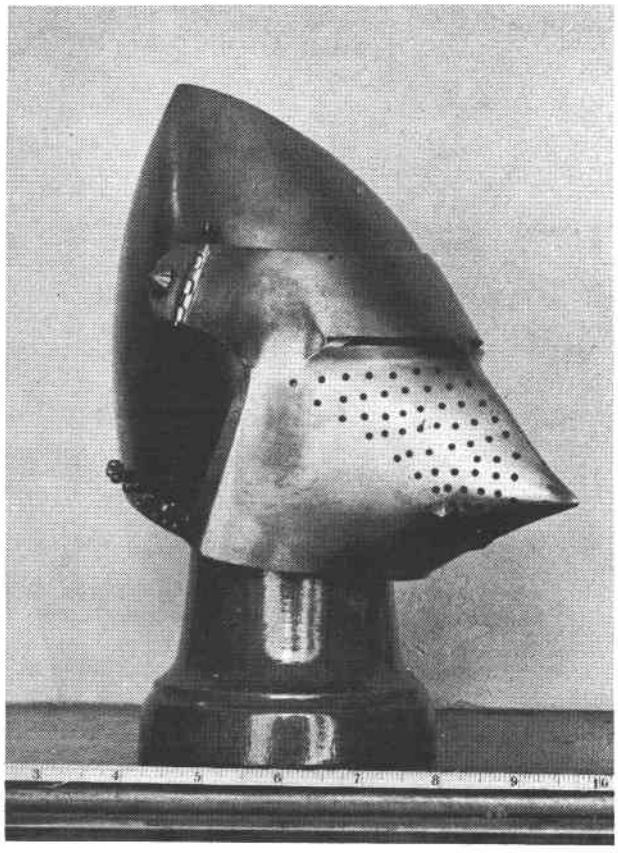
In collecting armor one has to be extremely careful. It is a very expensive hobby and during the last 100 years many fakes have been made. There are some very skillful mechanics and craftsmen today just as there has been in the past. It is advisable to study known originals, inside and out before buying. Even some of the so called experts have been fooled badly. As with any antique, seek advise from those who know.

Editor's note: Unfortunately for those who did not attend the Detroit meeting they missed a fine talk by Leonard Heinrich. About half of his talk was the narrating of a movie made several years ago at the Metropolitan Museum of Art and in Central Park in New York demonstrating the use of armor. This movie was very enlightening to many of us that knew too little about armor. To replace this part of Dr. Heinrich's talk we are showing here pictures of eight fine helmets made one half size by Dr. Heinrich with a brief discription of them.

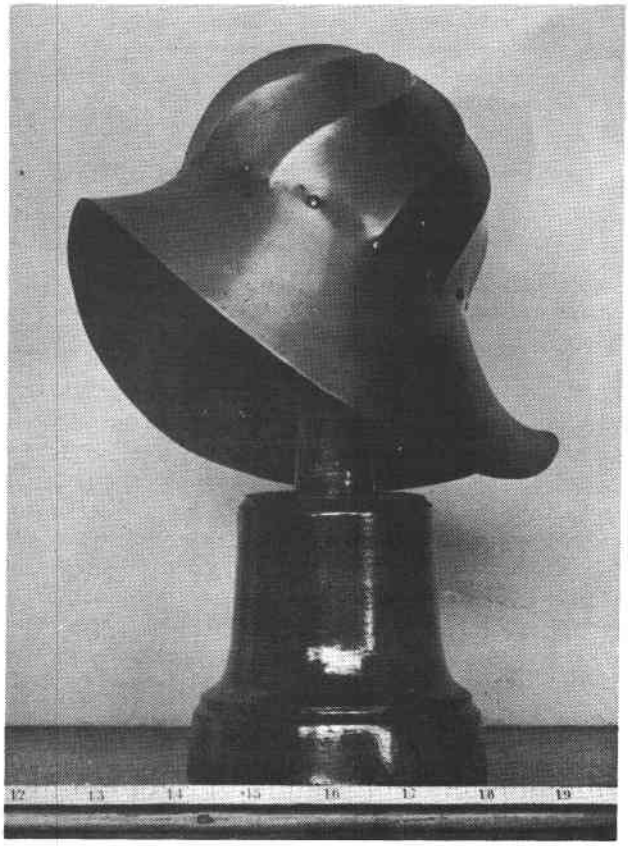
HELMET MODELS MADE TO ONE HALF SIZE
by Leonard A. Heinrich.



FRANKISH 6th CENTURY SPANGENHELM



BASINET, ITALIAN 1380-1400



SIEGE HELMET, ITALIAN 1460

SALADE, GERMAN 1475

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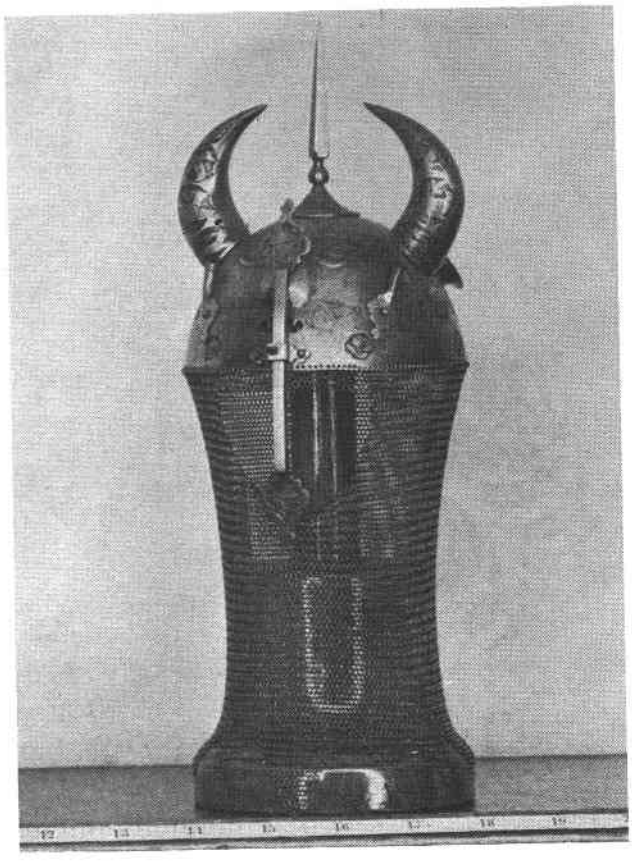
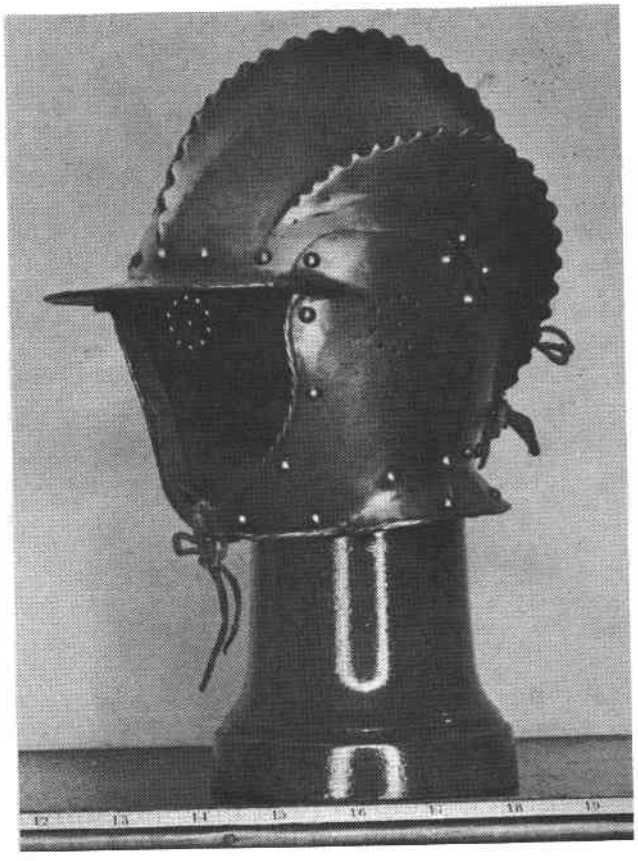
LOBSTERTAIL BURGANET, FRENCH 1600

ARMET, ITALIAN 1527



HUNTING HELMET, INDIAN 17th CENTURY



GERMAN HUNTING HELMET