

# X. TECHNOLOGICAL ASPECTS OF WEAPONRY

## THE USE OF INLAY TECHNIQUE IN THE PRODUCTION OF MEDIEVAL COURONIAN AND SEMIGALLIAN MILITARY EQUIPMENT (12TH TO 14TH CENTURY)

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### Abstract

The subject of this paper is the inlay technique, namely the hammering of fine silver to an iron object specially grooved for the purpose, and early medieval Semigallian and Couronian military equipment decorated in this technique. This includes sword hilts, strap dividers and mounts made by Baltic smiths, and a unique armour plate. The study of the inlay technique permits the former silver decoration on objects to be reconstructed. The ornate Couronian sword hilts provide grounds for hypothesising that there was a specialist weaponry workshop at Talsi hill-fort.

Key words: inlay, silver, iron, sword hilts, strap mounts, armour plate.

### Introduction

Inlay is used to adorn fine iron jewellery, using a wire, strip or sheet of precious metal, usually silver, and is accomplished without soldering.

Three techniques can be distinguished in inlay technology. The first and the simplest of these is the hammering of a silver or coloured-metal wire into specially made grooves. The second technique is more complicated, requiring considerable skill and knowledge. In this case, several strips of fine silver, between three and 19, are hammered to a specially prepared, finely grooved metal base. The third technique involves attaching a decorated silver or coloured-metal plaque in a previously prepared recess. The third method is rarely observed in Latvia during the study period.

The artefacts analysed in the paper, sword hilts, strap-dividers, mounts and a fragmentary armour plate, were found in the central part of the Kurzeme region, at the pre-Christian cemetery of Sāraji in the Lībagi parish of the Talsi district and in Lake Vilkumuiža (Talsi district), as well as at Tērvete hill-fort (Dobele district) in the south of the Zemgale region.

### History of the research

The concept of inlay (*Tauschierung*) was used in Latvia by Baltic German archaeologists in the late

19th and early 20th century. It is mentioned as early as 1842 by Friedrich Kruse (1842, Taf. 5:2) in a note on a sword found at Aizkraukle cemetery (Skrīveri parish in Aizkraukle district), probably an imported piece. The use of inlay for making iron spears and swords is mentioned in the notes to the figures in the catalogue of the Tenth All-Russian Congress of Archaeologists. However, in 1896 there was no real understanding of the process, since, as far as can be ascertained from the illustrations, spearheads silvered in an analogous technique are described indiscriminately as plated or inlaid. In later Latvian archaeological literature, there is practically no mention of inlay technique prior to the author's research.

Inlay has been discussed extensively in archaeological literature both east and west of Latvia, but hitherto only at a theoretical level, without providing any experimental evidence (Oldeberg 1966, p.274; Serning 1980, p.45, Fig. 45:2; Eniosova, Saratseva 1997, p.301). A doctoral thesis by the Swedish archaeologist Kristina Creutz, dealing with Type M spearheads on the shores of the Baltic Sea, touches on the subject of silvering technology, and is very interesting in this respect (Creutz 2003). She obtained analyses of a series of samples of silvering that represent a wide range of material. Varying amounts of mercury were found in many of these (Creutz 2003, p.296), and the results prompted her to suggest that the spear sockets were silvered using cold amalgamation. In this process, with

the help of mercury, the silver is slightly diluted, thus alleviating its attachment to the socket. Unfortunately, while concentrating on cold amalgamation, the idea of “direct beating of the silver onto the iron”, the essence of inlay, was in effect rejected (Creutz 2003, p.296). Also important are the studies by the German jeweller Erhard Brepol (1982, pp.338-342) and the archaeometallurgist Susan La Niece (1993, pp.102-114) on various contemporary silvering technologies, including inlay.

Nine analyses of samples of silver from medieval artefacts made in Latvia and one imported object were undertaken at the Latvian State Metals Standards Inspectorate. In these analyses, mercury, the presence of which should have been easily ascertainable, was not discovered. Mercury is an essential component for amalgamation, and its absence in the samples indicates that the objects had not been silvered by amalgamation. The silver content of the samples was 87.7% to 95.67%, testifying to the use of fine precious metal (Svarāne 2004, p.34; 2005, p.183; 2006, p.249).

The author organised a series of experiments indicating that the described technique can be implemented in practice, provided that silver of a high fineness is used, so that it is sufficiently soft. During the process, the object is systematically tempered. It has been shown experimentally that it is possible to forge together silver wire and flatten it in such a manner that it presents the appearance of a monolithic sheet (Svarāne 2004, pp.21-37).

Medieval swords found in Latvia have been described and partly analysed; but there is no general study on swords in Latvia. The earliest descriptions are from the late 19th century (Sizov 1896, p.37ff.). Most authors limit themselves to a description of the form of the sword hilt and blade. In the first half of the 20th century, the swords found in Kurzeme were described in more detail by Eduards Šturms (Šturms 1936a, pp.72-86). He concluded from his analysis of the archaeological material that the Couronian weapon smiths were fitting locally made hilts to imported blades (Šturms 1936b, p.114f.). Other researchers subsequently concurred with this conclusion.

In accordance with a tradition established in the early 20th century by the Norwegian researcher Jan Petersen, swords are divided into types, based on the form of the hilt (Petersen 1919, p.228). Petersen's typology is so comprehensive that many weapons researchers still rely on it, augmenting it as necessary with their own variants.

Important descriptions of swords have been given by the Lithuanian researcher V. Kazakevičius, who analysed Baltic swords found in both Latvia and Lithua-

nia (Kazakevičius 1996). The swords found in Latvia have been characterised by the Latvian close combat weapons and armaments specialist Māris Atgāzis. He mentions that a total of 190 double-bladed swords have been found in Latvia (Atgāzis 1998, p. 14). Detailed studies of sword blades have been undertaken by the historian of metallurgy Aleksis Anteins, devoting particular attention to inscriptions inlaid on the blades (Anteins 1964, pp.65-95; 1976).

Swords from Estonia have been studied by the archaeologist Mati Mandel (1991), while swords discovered in Russia have been analysed by the researcher of ancient Russian armaments (Kirpichnikov 1966). For a typology of the swords, I have used the classification of V. Kazakevičius (1996), which is the most appropriate for the Baltic.

## Sources

The rich and well-dated pre-Christian cemetery of Sāraji is located in the Lībagi parish of the Talsi district, on the left-hand side of the Riga–Ventspils highway, about ten kilometres from Talsi. The cemetery was excavated in 1989 and 1990 under the direction of Jānis Asaris, when 46 Couronian cremation burials were uncovered (Asaris 1990, pp.30-36; 1992, p.20ff.; 1994, p.15ff.). Sāraji cemetery is important, in the first place, because unburned objects were also provided in these Couronian cremation burials, in addition to burned grave goods, and these have preserved their silvering. The burials are precisely dated, to the 12th or 13th century.

A second very interesting site is Lake Vilcumuiža at Talsi: an important Late Iron Age Couronian burial site, where grave goods from cremation graves have been sunk in water. The site was initially investigated by Eduards Šturms in 1934, when 85 kilograms of artefacts were recovered: 1,300 objects (Šturms 1936a, p.73). Gradually, the number of recovered artefacts has grown to 3,000. The artefacts from Lake Vilcumuiža were burned on funeral pyres, and the original silvering has melted and fused to the object in the form of small spheres. When an object is exposed to great heat, a so-called “fire patina” forms on the surface, promoting its preservation and retaining an impression of designs that have melted away, as a result of which the design can sometimes be reconstructed. The majority of the artefacts found in Lake Vilcumuiža date from the 13th and 14th century.

Tērvete hill-fort was excavated in the 1950s by Emīlija Brīvkalne (1959a, p.35ff.). Fewer silvered artefacts from warriors' equipment have been recovered at this site, but they are interesting both in terms of their

similarity to the corresponding Couronian artefacts, and in terms of their local characteristics. These objects are not as well preserved as those found in Lake Vilkumuiža, and most of them are so thickly coated in chemicals that the original design is difficult or even impossible to reconstruct. The two uppermost layers at Tērvete hill-fort, where the analysed objects were found, were dated by the director of the excavations to the 13th century (Brivkalne 1959b, p.264).

In the tenth to the 14th century, the technique of inlay was quite widespread in Latvia. In western and central Latvia, artefacts made in inlay technique are mostly connected with weaponry and soldiers.

Traces of inlay and preserved silvering are found on the sword hilts and their components from the Sāraji cemetery: T Type swords and swords with a saddle-shaped or discoidal pommel.

### Type T sword hilts

At Sāraji cemetery silver-inlaid iron hilts from Type T swords and their components were the most common, found in five graves. In accordance with the classification of Kazakevičius, Type T swords include swords with a tripartite pommel, and a straight or slightly downwards-curving guard, while the T-1 (Couronian) sword pommel consists of five or even seven parts, with a narrow bronze lower guard, either straight or slightly downward-curving.

There are two examples of sword hilts with a design consisting of a string of rhombuses and a snail-like undulating pattern. One comes from disturbed male cremation grave 1, the other from very rich double male grave 30. It should be noted that grave 1 produced the lower guard of such a sword hilt, while the pommel and upper guard come from the topsoil above the burial. Judging from the size and design, these elements undoubtedly come from the same hilt, and are considered as deriving from grave 1. The hilts have a tripartite pommel and a lower guard with ends slightly downturned (in the custody of LVM, No. A 12816: 220, 217). Fragmentary remains of a joint of iron pins were found in the pommel.

All three sword hilt elements from grave 1 have very well-preserved ornate silver decoration (Plate VII: 1). The design that once adorned the hilt from grave 30 can be clearly traced from the presence of a shallow recess intended for silver strips. The ornamenting technology is indicated by the clearly visible grooves for inlay on the lower guard.

The sword guards from grave 1 are decorated on one side with a string of rhombuses. Inlaid on the other side

was a snail-like undulating pattern, augmented with irregular, approximately plane-convex areas of silver. The crossed bands and snail pattern forming the rhombuses were created by forging together between four and six strips of silver, while the plane-convex areas of silvering consist of as many as 19 separate silver wires.

In parallel with the outer contours of the basic elements of the decoration, there is a decorative band of inlay, appearing as a braid of two wires, silver and copper, but on closer inspection found to consist of a large number of miniature alternating oblique sections of inlaid silver and copper wire.

The string of rhombuses consists of crossed bands, a design found on many Couronian artefacts. The design on the guards was inlaid in an unusual manner on the hilt: on one side of the hilt, the upper guard had the snail-like undulating pattern, and the lower guard had rhombuses. On the other side of the hilt, the designs are the other way round: the upper guard had rhombuses and the lower guard had the undulating pattern.

It should be added that the lower part of the upper guard and the upper part of the lower guard were also decorated with a design of rhombuses and triangles arranged in a net pattern. This design consisted of inlay of silver wires (Plate VII: 1).

One of the triangle designs on the “shoulder” of the pommel, and likewise a rounded band on the middle part, consisted of an imitation undulating pattern, created with particular care and skill from a large number of miniature inlaid sections of copper and silver wire.

Sword hilts with a dot-and-circle or “eye” design have been found with two undisturbed male cremation burials. The silvering is best preserved on a sword found in grave 41 (in the custody of LVM, No. A 12820: 474). All the parts of these were decorated in the same manner: both the pommel and the guards in a silver plaque, in which a design of concentric circles has been created (Plate VII: 2; Fig. 1). In the literature, this design is also referred to as a pit or hollow design. The term “eye” design has also been used. Such a design really does have associations with an animal’s eye, since each hollow is surrounded by a black ring, and then a silver circle.

The differences between these hilts are minor, and relate to the size of the elements and the number of dot-and-circle designs: the sword hilt from grave 34 has slightly more of them. The pommel and upper guard from grave 34 have been exposed to a very high temperature. Copper and silver, which once adorned the upper part of the hilt, has not only melted, but has also fused together, forming billon, an alloy of the two

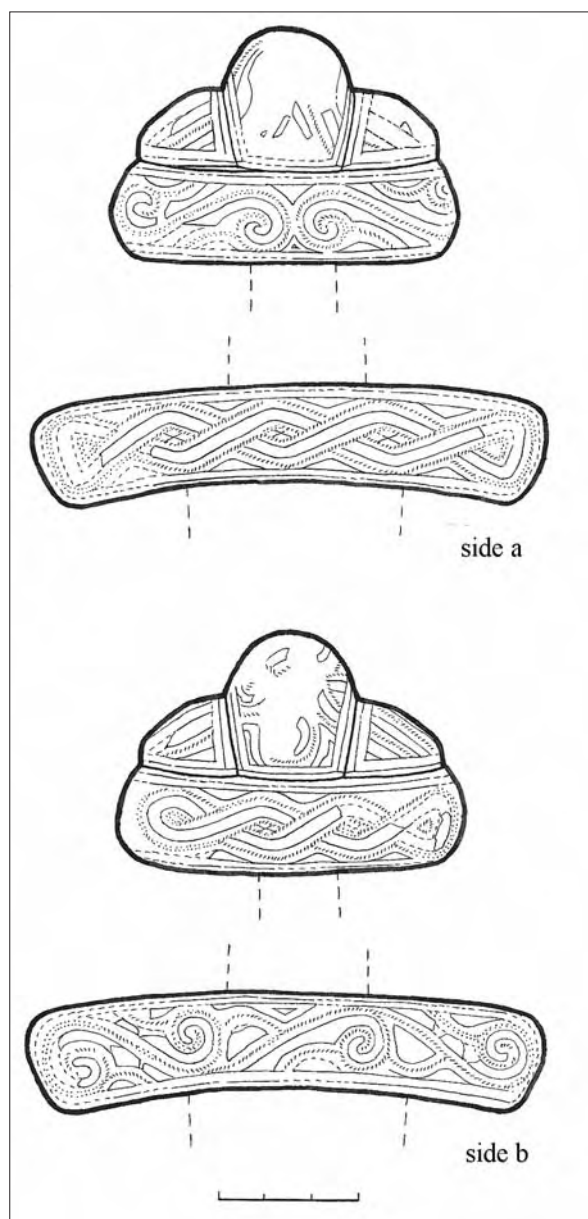


Fig. 1. Sārāji (Talsi district) grave 41. Type T sword hilt, lateral and face view, and details of the hilt: the upper face of the pommel, the lower face of the upper guard and the lower face of the lower guard (drawing by A. Ivbulē, in the custody of LVM, No. A 12820: 474).

metals, lightly covering both components and lightly colouring them yellow-brown. Traces of the original silvering are seen in the form of inlay grooves and silver spheres. Preserved on the lower guard is a triangular area consisting of silver strips, as is the dot-and-circle design, consisting of copper melted into the grooves, surrounded by a black band of iron and a circle of silver.

The dot-and-ring or “eye” designs on the components of the hilts are about ten millimetres in diameter, arranged in two rows. Even before the silvering, copper had been melted into the circular hollows. This design on sword hilts was popular in Latvia and in neighbour-

ing countries. The dot-and-ring designs were various-sized, arranged on the guards to form between one and four rows. A similar design is also found on hilts cast in bronze.

In archaeological literature there are references to the “eye” design as a significant feature for distinguishing sub-types of swords. For example, the Estonian armaments researcher M. Mandel distinguishes swords with an “eye” design as one of the sub-types of Type T (Mandel 1991, p.131).

#### The sword hilt with a plant tendril design

Guards from one more Type T sword hilt were found with undisturbed male cremation grave 12. Corresponding to these guards in terms of form and size is a sword pommel recovered as a stray find in excavation area 5. The form of the hilt components corresponds entirely to Type T, a tripartite pommel with an emphasised middle part and rounded, sloping lateral parts. The upper guard is almost straight, only very slightly upturned, while the lower guard has the tips slightly downturned. There is copper wire inlaid along the edge of the outer side of the lower guard, rather than the more usual silver wire. On the other hand, in this case the upper guard does not have the usual wire inlay along the outer edge. The elements of the hilt are more simply decorated and slightly smaller than on other swords of this sub-type.

The basic design on both guards consists of irregular curving lines reminiscent of stylised plant tendrils. The design is not preserved in its entirety, but it was found that the curved lines of the floral design consist of a large number of short sections of silver and copper wire, inlaid close together and arranged alternately. On the pommel, the coloured metal is preserved in only two places: small amounts of obliquely inlaid miniature sections of silver wire are seen, resembling the design on the guards.

Silvering was found on three sword hilts with a saddle-shaped tip. The first of these was found in the vicinity of Saldus. (The sword is on display in the permanent exhibition of Kuldīga District Museum.) The guard had a concentric rhombus consisting of silver wire inlay. Only part of the sword pommel is preserved. It was decorated with a design of rhombuses and triangles arranged in bands, inlaid with silver wire. The wire inlay formed a herringbone pattern along the sides of the pommel, but this design cannot be traced in full.

A second sword with a silvered pommel and guard was found in Lake Vilkmuiža. A plaque consisting of in-



laid silver strips covers almost the whole of the pommel and guard.

A third sword of this type has been recovered as a stray find at Sāraji cemetery. It has marked grooves cut on both sides, vertical or in the form of oblique crosses. On one side of the guard, traces of white metal are preserved, but these do not resemble typical traces of inlay. The white metal has been grooved from the top in a similar manner to the iron, and there are none of the usual fused silver spheres on the guard, but unusual molten pieces instead. Although Kazakevičius has indicated that this sword would have been silvered, metal analyses are necessary to confirm this (Kazakevičius 1996, p.160). The sword is kept in Talsi Museum.

A sword hilt with a discoidal pommel silvered in inlay technique was found with grave 25 at Sāraji cemetery. The sword has not been cleaned of corrosion. It can be seen that the guard is decorated with irregularly arranged, curved silver strips. It is possible that the design will be decipherable after restoration.

### Horse-trappings

The equipment of the medieval soldier included horse-trappings – leather straps for the bridle and saddle, together with strap-dividers. In many cases, the bridle was decorated with ornate, silvered iron fittings of various kinds (including strap-ends). The soldiers had leather belts with silvered iron buckles and mounts. The function of the bridle and belt fittings can be determined from their size, but not in all cases. The horse-trappings were decorated with larger pieces, while the smaller pieces would have been used for the straps of the horse-trappings and for soldiers' belts.

Considerable numbers of silvered bridle, strap and belt fittings have been found in Lake Vilcumuiža and Sāraji cemetery, with smaller numbers at Tērvete hill-fort.

Constituting one of the largest groups are sets of objects consisting of a large shield-shaped strap-divider with strap-ends threaded into it. This set consists of shield-shaped discs with a spherical bulge at the centre and three rectangular perforations, each of which has two or three rectangular or trapezoidal strap-ends passing through it. The leather strap was attached to the iron disc by means of a long strip of metal on the back of each strap-end.

The diameter of the discs varied between 47 and 72 millimetres, while the strap-ends may be divided into three size groups: a) small strap-ends (48 to 50mm long and 21 to 23mm wide); b) the most commonly occurring medium-sized strap-ends (50 to 69mm long and 19 to 27mm wide); c) large strap-ends (93 to 101mm

long and 33 to 35mm wide). The mean thickness is two to three millimetres.

From Sāraji cemetery there are 16 such shield-shaped strap-dividers with strap-ends threaded in them, 14 of these deriving from eight richly furnished male cremation burials, the remaining two being stray finds (Svarāne 2006, Fig. 3). The best-preserved silver ornamentation is to be found on the strap-divider and strap-ends from grave 9 at Sāraji cemetery (Fig. 2). Forty analogous strap-dividers have been found in Lake Vilcumuiža (Svarāne 2005, Fig. 1), and 24 shield-shaped dividers have been identified at the cemetery of Piltenes Pasilciems.

In terms of form, these strap-dividers are similar, but the strap-ends in this assemblage are more diverse. The two lateral strap-ends tend to be the same, while the third, directed downwards, is sometimes similar in size, but in other cases is considerably larger. The strap-ends generally have undulating margins, or less commonly straight margins. The form of the ends also varies: they may be straight, trapezoidal or tripartite (Svarāne 2006, Fig. 3, 4).

Similar in terms of function, but slightly different in form, is the strap-divider in the form of an oval plaque with three perforations, with two preserved strap-ends with undulating lateral margins, that was found on Tērvete hill-fort (in the custody of LVM, No. VI 24d: 1140). The strap end is 58 millimetres long, and 1.5 millimetres wide and thick, while the oval plaque is 36 millimetres long, 20 millimetres wide and 2.1 millimetres thick. A silver wire is visible, inlaid along the outer margin of the disc. Very little is preserved of the rest of the silvering, and the artefact is covered in chemicals, on account of which the design cannot be reconstructed in full.

These strap-dividers served for fastening the saddle: they were attached to the breast collar of the saddle, and the strip on the back of the mount was intended to withstand considerable physical stress, preventing the saddle from sliding in the course of battle (Svarāne 2005, Fig. 4, 1).

Two forms of fairly large, very unusual kinds of strap-ends have been found in Lake Vilcumuiža and Sāraji cemetery. The first of these consists of an elongated plaque with openwork discs at one end, the other end being bifurcated (Svarāne 2005, Fig. 2:2). Six of these come from Lake Vilcumuiža, and one from Sāraji cemetery. These strap-ends are 120 to 130 millimetres long, 40 to 50 millimetres wide and two to three millimetres thick. They are decorated on top with a spiral design in inlay technique, consisting of curved lines constituting a design of circles. In the middle is a lunula figure with



Fig. 2. 1 Sāraji grave 9. A horse's breast collar strap-divider with strap-ends (drawing by A. Ivbule, in the custody of LVM, No. A 12816: 121).

curled ends, while the rectangular strips of metal have notches or incisions along the sides.

Outside Latvia, one analogous mount of this group has been found in Estonia, at the hill-fort of Pähklimägi in Viljandi (Valk 2000, p.67).

There is a second unusual form: tripartite strap-ends. These consist of two elongated plaques with a decorative openwork mount attached at the end. Four such pieces have been found in Lake Vilikumuiža, and two more at Sāraji. Both elongated plaques have a quadripartite thickened section in the middle (Svarāne 2005, Fig. 2:1). The most ornate mount from Lake Vilikumuiža (in the custody of LVM, No. A 10994: 1526), has a total length of 138 millimetres, a width of 19 millimetres and a thickness of 28 millimetres. There are rivets at the top ends of both elongated plaques, serving for the attachment of a leather strap. Suspended from the lower part was an openwork plaque, reminiscent of two cup-shaped flowers.

In a reconstruction of Couronian horse tack, the openwork single-piece strap-ends bifurcated at the end are regarded as having been located on the horse's forehead, with the tripartite strap-ends at the ears (Svarāne 2005, Fig. 4:2, 3).

From the Kurzeme region there are also a considerable number of iron strap mounts representing another seven forms, which would originally have been silvered. In Zemgale, there is less diversity: three forms of mounts have been identified.

From Sāraji there are 15 examples of elongated mounts with undulating lateral margins. These mounts are generally 32 to 60 millimetres long, 11 to 20 millimetres wide and 1.5 to two millimetres thick (Svarāne 2006, Fig. 2: 2, 6). From Tērvete hill-fort there are four entire mounts and one fragmentary mount of this kind. Characteristic of these mounts is a design of crossed bands.

It should be noted that four finds from Tērvete hill-fort and one of the pieces from Sāraji have an iron hook riveted to one end, most probably for fastening.

A second, more numerous group of elongated silvered iron mounts consists of mounts with saw-tooth lateral margins. Ten such pieces have been recovered at Sāraji, and seven from Lake Vilikumuiža. These mounts with saw-tooth margins are of various sizes, 83 to 60 millimetres long, 24 to 10 millimetres wide and three to 0.5 millimetres thick. Saw-tooth mounts silvered in inlay technique were also favoured by

the Livs. The reconstruction of Couronian mounts is actually based on analogous mounts from the Liv area, namely from the Salaspils Mārtiņšala finds (Svarāne 2005, Fig. 3:3). Mounts of similar form, but made from bronze, are very common finds in Latvia.

Fewer in number are other kinds of iron strap mounts. From Lake Vilikumuiža there are ten almost square or round mounts with triangular projections at the corners (Svarāne 2005, Fig. 3:1). These are comparatively small: the edges of the square pieces measure 26 to 28 millimetres, while the circular ones have a diameter of 25 to 28 millimetres. The mounts are 1.2 to 2.3 millimetres thick, and generally have the stem of a rivet on the back – a small bar used to attach the object to a leather strap.

Three elongated mounts have been found at Sāraji, consisting of an oval mid-part, on the outside of which two semicircles had been added on each side. One of the mounts is whole, the other two being fragmentary. The whole piece is 68 millimetres long, 14 millimetres wide and two millimetres thick (Svarāne 2006, Fig. 5:2). A mount from Tērvete hill-fort has a similar form of margin (in the custody of LVM, No. VI 24a: 569, dimensions: length 90mm, width 42mm, thickness 2.3mm). This piece is significantly more robust than the examples from Sāraji. The Tērvete mount is fragmentary, but the narrow ends evidently had the form of a gable roof. At the centre of the mount, a semicircular protuberance has been made, reminiscent of those on the shield-shaped strap-dividers. The silvering is partly preserved: it consisted of a wire inlaid along the outer edge and forming a circle in the circular central part, augmented with oblique miniature sections of inlaid wire. Partly preserved on the figural ends of the mount is a design consisting of wire inlay, resembling the capital letter "omega" of the Greek alphabet. The silver is

preserved in the form of a separate area on the “boss” of the central circular part, and on the lateral parts.

A mount with a similar form of margin, but without the semicircular protuberance, is known from the early town site of Sabile (Talsi district). It is 65 millimetres long, 28 millimetres wide and 3.7 millimetres thick. This piece was decorated with copper in addition to silver.

There is also an example of a rare kind of iron mount from Tērvete hill-fort. The irregular margin of each edge of the mount is in the form of a semicircle and a lunula. It has two openings made in opposite corners. At one end, the mount has a hook riveted to it, thought to have served for fastening. Only remnants of the decoration are visible. This mount is in the custody of LVM, No. VI 24d: 1067, it is 61 millimetres long, 33 millimetres wide and 1.4 millimetres thick. It has been established that there was a silver wire, augmented with oblique miniature inlaid sections, around the circular openings and along the outer margin. The artefact has been covered with a thick layer of chemicals, obliterating the traces of the recesses for inlay. In terms of form, the mount is reminiscent of a find from Buchholtz's excavations at the castle of Salaspils Mārtiņšala in the Riga district (No. RDM I 132).

There are also several unique mounts. One medium-sized circular openwork mount has been found in Lake Vilkumuiža. It has a partly preserved impression of the design – inlaid around four openings are volutes forming spirals, consisting of several concentric rows or bands of wires. Silver triangles were attached between the volutes, and in the centre, around the raised area of the rivet, is a rhombus (Svarāne 2005, Fig. 3:5). There is some trace of criss-crossing inlay grooves. The object's surface is corroded and pitted, but it was once most beautifully decorated. The mount is 42 millimetres in diameter and 0.8 millimetres thick. There is no information about possible analogies for this form of mount.

One unusually shaped elongated cruciform mount has been recovered at Sāraji. At the sides it has an extension, with double discs hammered on at each side. Only half of the mount, with the extension, is preserved. The other half has broken off (Svarāne 2006, Fig. 4:1). The mount has a total length of 51 millimetres, of which a 32- millimetre-long fragment is preserved, with a width of 35 millimetres and a thickness of two millimetres. An impression is preserved of the silver decoration: criss-crossing bands formed a ring in the centre of each disc, with a rhombus at the centre of the mount. There are no known parallels for this find.

Depending on the size of the mount and its thickness, these mounts could have been attached to a soldier's belt or to a horse's bridle. Medium-sized and small mounts generally adorned the intersections of bridle straps and the lateral straps of the bridle (Svarāne 2005, pp.4, 5 and 7).

Sometimes, interesting results can be obtained when old collections are re-examined. In sorting through the artefacts recovered in 1954 at Tērvete hill-fort, I observed that object No. 24b: 725, registered as a spade fragment, is in fact a fragment of an altogether unique silvered iron armour plate. The preserved fragment has a length of 73 millimetres and a width of 44 millimetres. Because of corrosion, the plate varies in thickness between two and 4.5 millimetres. One preserved margin of the plate is figural, consisting of two semicircles, divided in the centre by a small rectangular projection. A small triangular projection has been made in each semicircle. This margin of the plate had two holes for rivets, one of which has now rusted up. The silvering is partly preserved, and so far it has not been possible to clean the rust off the artefact completely. It has been found that the design consisted of a large number of silver strips, arranged in concentric circles around both openings. These large circles are connected in the middle with a band of V-shaped lines. When the artefact is cleaned, the design will be more clearly visible. Lamellar armour appeared in Latvia in the late 13th century, and was hitherto regarded as only having been used by the German knights (Atgāzis 1998, p.21).

The object was found in the cultural layer at a depth of 34 centimetres. It is possible that it belonged to a high-ranking Semigallian chief. The armour may have been made by local masters: they certainly did not lack the necessary skill. The design, consisting of concentric bands around the openings, and the technique of inlaying the silver, are characteristic of locally made objects. However, there is a possibility that this ornate armour was the work of foreign masters, and the Semigallian noble may have obtained it as a war trophy or gift. Neither can the possibility be ruled out that it belonged to a Crusader knight. Armour decorated with silver had great value. There are no analogies for this unique artefact.

## Chronology

The material from Sāraji cemetery has the advantage that the chronology of the grave inventories has been securely established. The director of the excavation, Jānis Asaris, indicates that most of the male burials date from the 12th and 13th century (Asaris 1994, p.18). Even more precisely dated are the Type T swords

Dimensions of the Type T swords from Sāraji cemetery (all measurements in millimetres).

Grave No.	Element	Acc. No.	Length	Thickness	Height
1.	pommel	A 12816:220	62	30	28
”	upper guard	A 12816:217	72	24	27
”	lower guard	A 12816:220	108	25	18
34.	pommel	A 12820:305	67	23	28
”	upper guard	A 12820:306	83	21	25
”	lower guard	A 12820:307	113	24	28
41.	pommel	A 12820:474	67	23	28
”	upper guard	” ”	74	23	18
”	lower guard	” ”	97	20	16
12	pommel	A 12816:402	50	19	20
”	upper guard	A 12816:159	57	15	13
”	lower guard	” ”	80	18	15

from graves 25, 30 and 41, as well as the sword with a saddle-shaped pommel from grave 39 and the sword with a discoidal pommel from grave 25 (Kazakevičius 1996, p.109, 120 and 123).

The horse-trapping and belt mounts from Lake Vilcumuiža date from the 13th and 14th century, while the belt mounts from Tērvete hill-fort are 13th century. In accordance with E. Brīvkalne's date for the first, top layer of Tērvete hill-fort, the armour plate dates from the late 13th century.

The analysed artefacts would have been made at Talsi and Tērvete hill-forts, which were major administrative and craft centres. The analysis of inlay technique opens up new possibilities for studying the high level of craftsmanship of the Couronian smith. An analysis of the artefacts and the ornate decoration on them reveals the attractiveness and splendour of the equipment used by Couronian and Semigallian soldiers.

Translated by Valdis Bērziņš

#### Abbreviations

LVM – Latvian History Museum, Rīga.

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## VIDURAMŽIŅU (XII–XIV A.) KURŠIŅU IR ŽIEMGALIŅU GINKLUOTĒS INKRUSTAVIMO TEHNOLOĢIJOS

### Dagnija Svarāne

#### Santrauka

Inkrustavimo technologijos buvo naudojamos geležies juvelyrinės dirbiniai puošti. Inkrustuojama buvo viela, sidabro ar kito spalvotojo metalo juostelėmis bei plokštelėmis jų nelituojant. Dirbiniai puošti buvo naudojamos trys skirtingos technologijos. Pirmoji ir paprasčiausia buvo sidabro ar kito spalvotojo metalo juostelių įkalimas į dirbinyje paruoštus griovelius. Antroji inkrustacijos technologija buvo sudėtingesnė ir reikalavo didelio meistriškumo bei žinių. Dirbant šia technologija keletas aukštos (tarp 3 ir 19) prabos sidabro juostelių buvo įkalama į specialiai dirbinyje paruoštus griovelius (1–2 pav.; VII: 1 iliustr.). Trečioji inkrustacijos technologija yra dekoruotų sidabro ar kito spalvotojo metalo plokštelių tvirtinimas dirbinyje paruoštose duobelėse (VII: 2 iliustr.). Šia technologija puošti dirbinių Latvijoje aptinkama retai.

Šiame straipsnyje analizuojamos įvairios ginkluotės dalys (kalavijų rankenos ir buoželės, diržų skirstikliai, diržų galų apkalai), rastos Sāraju (Lībagiū apylinkė, Talsiū r.) kapinyne ir Vilkuņģas ežere, Talsiū mieste.

Abu šie paminklai yra centrinėje Kuržemėje. Straipsnyje nagrinėjami ir Tērvetės piliakalnyje (Dobelės r.) bei pietinėje Žiemgalos dalyje rasti šia technologija puošti dirbiniai.

Straipsnio autorė atliko daugelį eksperimentų, siekdama įrodyti, kad aprašytosios sudėtingos technologijos gali būti taikomos praktikoje. Sāraju kapinyne ir Vilkuņģas ežere rasti inkrustavimo technologija puošti dirbiniai buvo gaminti Talsiū ir Tērvetės piliakalniuose, kurie buvo administraciniai ir amatų centrai. Vilkuņģas ežeras yra tik 10 km už Tērvetės. Taigi galima daryti išvadą, kad Talsiū piliakalnyje veikė specialieji ginklų dirbtuvės.

Inkrustavimo technologijos analizė atveria naujas galimybes kuršiū ir žiemgaliū kalviū meistriškumui studijuoti. Jų ginkluotės ir ekipuotės turtingumą rodo tirtų dirbinių puošnumas bei išskirtinis grožis.