

A Roman late-republican *gladius* from the river Ljubljana (Slovenia)

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Izvleček

V Ljubljani je bil približno 2,5 km od Navporta najden rimski meč v nožnici. Na sprednji strani nožnice je mrežast okov, ki je na rimskih mečih izredno redek, na hrbtni strani pa sta tenek pravokoten okov in vanj vsajena masivna zanka z dvema luknjama. Dolžina, oblika in izrazito podolgovata konica meča nakazujejo, da je nastal v poznorepublikanskem času. Po tipoloških kriterijih se zdi predhodnik meča s Štalenske gore, ki je njegova najboljša analogija in je bil najden v zgodnjeavgustejski plasti.

Iz analiz kovin izhaja, da so vsi okovi na nožnici narejeni iz medenine. Poglobljen pregled literature o začetkih njene uporabe v Italiji je pokazal, da Avgustove denarne reforme l. 23 pr. n. š. ne smemo enačiti z začetkom širše uporabe medenine v Italiji in da medeninasti okovi na nožnici meča, izdelani verjetno na začetku druge polovice 1. st. pr. n. š., niso presenetljivi.

CIRCUMSTANCES OF THE FIND AND ITS FIND-SPOT

The National Museum of Slovenia (NMS) purchased a sword in its scabbard (Inv. no. V 1366) in 1993. It came to the museum in three pieces: the upper part, the lower part including the tip, and a fragment of guttering (cf. Perovšek, Milič 2000, Figs. 1; 2). There was a thick and very hard layer of riverine deposits on the scabbard, which was skilfully removed during conservation (cf. the report on the conservation and restoration in this volume = Perovšek, Milič 2000).

The sword in its scabbard was found by a non-archaeologist, in the river-bed, about 50 metres

Abstract

A Roman sword in its scabbard was found in the river Ljubljana about 2.5 km down-stream from *Nauportus*. On the front of the scabbard is a net-like fitment for which just a few analogies exist. Two extremely unusual fitments are apparent on the back of the scabbard: a thin flat rectangular fitment surmounted, in the middle, by a substantial protruding fitment with two holes. The length and proportions of the scabbard as well as its elongated point are indicative of a late-republican date. It may be seen as the typological predecessor of its closest parallel, that is, the sword in a scabbard from Magdalensberg, which was found in a layer dated to c. 30-20 B.C. The sword and scabbard from the Ljubljana can be dated to about the beginning of the second decade of the first century B.C.

The PIXE analyses showed that all the fitments on the scabbard were made of brass. A study of the beginnings of the use of brass has shown that Augustus' monetary reform of 23 B.C. was not synchronous with the introduction of brass technology to Roman Italy, and that occurrence of brass fitments on a scabbard dated to the beginning of the second half of the first century B.C. is not unexpected.

down-stream from where the Hočevarica sewer joins the Ljubljana (*Fig. 1*), and about 2.5 km from Dolge njive at Vrhnika/*Nauportus* (*Fig. 2*). It was attached to a big stone near the bank of the river. When found, the sword was in two pieces which were still joined together by the spine of the net-like fitment.¹

DESCRIPTION OF THE SWORD AND ITS SCABBARD

The entire length of the sword seems to have survived. In fact, the broken edges of the upper and lower part of the sword fit together very well

¹ The author would like to thank the finder for this information.

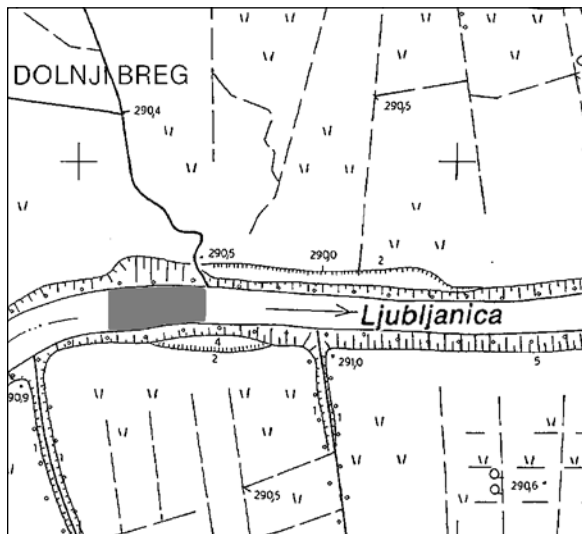


Fig. 1: General topographical map 5 (sector of Vrhnik sheet 28) showing the find-spot of the sword.

Sl. 1: Temeljni topografski načrt 5 (izsek iz Vrhnika list 28) z vrisanim območjem najdišča.

(Figs. 3; 4). The scabbard, thus appears to be 65 cm long and 5.5 cm wide (including the guttering) at its widest point near the mouth. It is relatively long, with a long tapering point. The probable remains of the handle have corroded into amorphous pieces held together by river sediments. An X-ray photograph (cf. Perovšek, Milič 2000, Fig. 3: a) showed no trace of any tang.

The scabbard was of maple (*Acer sp.*) or nut wood (*Juglans sp.*).² At the upper edge of the back, there are probable traces of leather (Fig. 12; Perovšek, Milič 2000, Fig. 7).

The scabbard seems to have been made of two wooden halves, the front and the back. They were

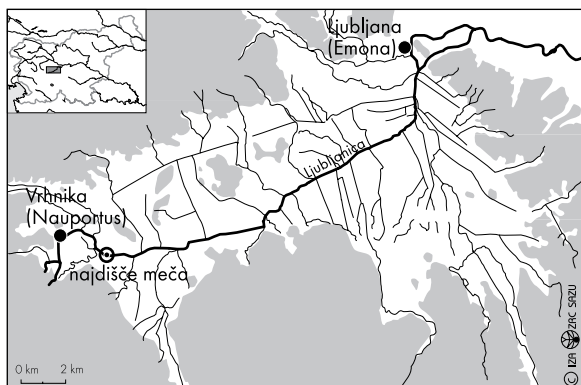


Fig. 2: Map of the environs of the find-spot of the sword.
Sl. 2: Lega najdišča meča v širši okolici.

² Analysis by M. Culiberg, ZRC SAZU, Ljubljana. It was impossible to provide an exact identification of wood, because the sample was taken after the conservation, during which the wood had been impregnated with sugar.



Fig. 3: The sword in its scabbard: a) front, b) back.
Sl. 3: Meč v nožnici: a) sprednja stran, b) zadnja stran.

fixed together with a U-shaped guttering, which starts at 4mm below the upper end of the scabbard and continues without interruption, ending in a sub-circular knob. The analyses of the surface of the metal by the PIXE method at five points on the guttering and at three points on the tip showed that it was made of brass (copper and c. 14.9-20.4% of zinc; cf. Šmit, Pelicon 2000, 184, Table 1 and Fig. 1: points 4, 9, 13, 20-24).

It seems most likely that the guttering was made by hammering out five or seven pieces of brass and then soldering them at four or six points. Three of these junctions survive: at the two points where the lower transverse mount was rivetted to opposing sides of the guttering (Figs. 5; 6), and on the loose fragment of guttering (Fig. 7); the last must



Fig. 5: The upper right solder-point of the guttering.
Sl. 5: Spajkanje robnega okova na desni strani.



Fig. 6: The upper left solder-point of the guttering.
Sl. 6: Spajkanje robnega okova na levi strani.

have been so positioned that its soldering point lay about 10 cm below the upper soldering point and slightly above the middle of the scabbard. For this fragment and for the upper right soldering-point, the metal analyses provided the following results: the brass guttering was soldered with an alloy basically of tin (c. 69 and 75%) and lead (c. 21 and 12%; cf. Šmit, Pelicon 2000, Table 1 and Fig. 1: points 1, 12) to a 3 cm long, U-shaped lining of bronze containing 5-6% tin (cf. Šmit, Pelicon 2000, 184, Table 1 and Fig. 1: point 17). The lower half of the guttering, including the knob at the tip, seems to have been made in one piece or alternatively there might perhaps have been two other points of soldering at the tip, c. 11 cm above the knob, where the guttering does not survive (cf. Fig. 10).

On the front of the scabbard is a net-like fitment comprising a rod-like spine with transverse cross-bars (Figs. 3: a; 4). The intersections of the spine with the cross-bars were decorated with four pairs of grooves. The upper intersection, where the spine bifurcates into two cross-bars, has especially skilful decoration. The spine is not uniform in

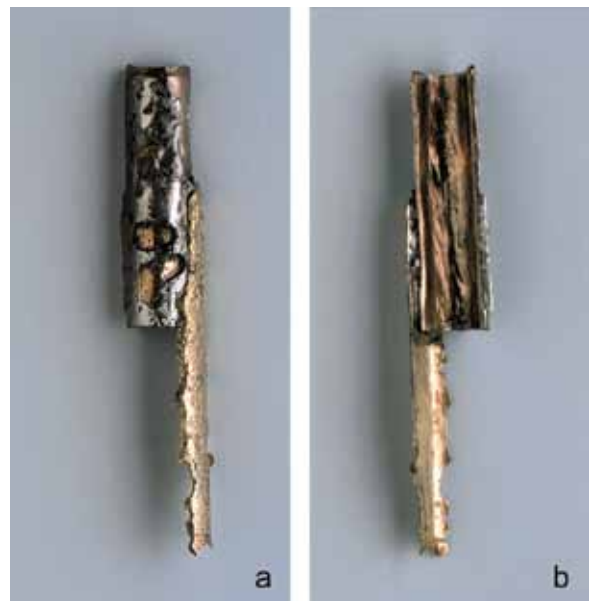


Fig. 7: The loose fragment a) front, b) back) showing how the brass guttering was soldered to a U-shaped lining of bronze, c. 3 cm long.

Sl. 7: Odlomek robnega okova: a) spredaj, b) zadaj. Dobro je vidno, da je medeninast okov prispajkan na pribl. 3 cm dolgo, U-oblikovano podlogo iz brona.



Fig. 8: The second cross-bar of the net-like fitment, the terminals of the transverse fitments and the animal-head terminals.
Sl. 8: Drugo križišče na mrežastem okovu nožnice, zaključki prečnih okovov in zaključka v obliki živalskih glav.



Fig. 9: The fifth cross-bar of the net-like fitment.
Sl. 9: Peto križišče na mrežastem okovu nožnice.

section. At approximately mid-way between each intersection it is flattened on both sides, and two pairs of transverse grooves separate this zone from the longitudinal raised rib of the spine. On the upper side, this rib can also be seen at the cross-bar junctions. The net-like fitment was not rivetted to the scabbard but each cross-bar was bent around the guttering and pressed back against the reverse side of the scabbard (*Figs. 3: b; 4*). It seems that the spine of this fitment and four of the cross-bars were made in one piece, but the second and fourth cross-bars (*Figs. 8; 9*) were made separately, and were positioned under the spine, and rivetted and soldered to it with an alloy basically of tin (c. 55%), lead (c. 26%) and copper (c. 13%? but probably “contaminated” because of the brass in the vicinity; cf. Šmit, Pelicon 2000, Table 1 and Fig. 1: point 8). At the seventh intersection (*Fig. 10*), the chape fitment was joined to the spine in the same way. Metal analyses on the surface have shown that both the net-like fitment and the chape mount were made of brass (the zinc

content at the measured points was c. 15-18%; cf. Šmit, Pelicon, 2000, Table 1 and Fig. 1: points 7, 10, 16, 19).

On the back of the scabbard there are two transverse fitments, each about 7 cm wide and 9.8 cm apart (*Fig. 12*). These were bent back over the guttering to the front of the scabbard (*Fig. 11*) to form loops for suspension rings on both sides, and were rivetted to the guttering. According to the analyses, they were made of brass containing c. 17-19% zinc (cf. Šmit, Pelicon 2000, Table 1 and Fig. 1: points 6, 15).

On the back of the sheath below the upper transverse fitment, is a most unusual mount (*Fig. 12*). It is rectangular, and its four corners terminate in transverse bands, which were bent back over the guttering, and which have animal-head terminals on the front of the sheath (*Fig. 11*). Only the left ones survive. At the mid-point of this fitment was a large hole, 6.5 mm in diameter (*Fig. 13*). At this point, a substantial rectangle with two holes protruded transversely from the fitment. On the X-ray photograph of the longitudinal section (Petrovšek, Milić 2000, Fig. 5: a), it is clear that it did



Fig. 10: The seventh cross-bar of the net-like fitment and the point of the scabbard.

Sl. 10: Sedmo križišče na mrežastem okovu nožnice in konica nožnice.

not penetrate very deep into the wood beneath, as might be expected, but protrudes only about 2-3 mm below the thin mount with the hole and widens(!) slightly. An additional X-ray photograph was made to gain an impression of the cross section (Perovšek, Milić 2000, Fig. 5: b; 6). Remarkably it showed that the substantial rectangle was no wider than the hole into which it was slotted, so it remains unclear how it was fixed to the sheath.

PIXE analyses of the rectangular mount and the protruding rectangle showed that they were both made of brass with a zinc content on the surface of c. 15.5 to 18.6 % (cf. Šmit, Pelicon 2000, Table 1 and Fig. 1: points 5, 14, 18).

In its present condition, it is impossible to remove the sword from its scabbard. The iron sword-blade is visible on the right edge, just below the upper transverse mount (Figs. 3: a; 4). At this point, its estimated width is 4.5 cm at most. A similar or slightly smaller dimension can be deduced from the distance between the rivets on the transverse fitments (4.8 and 4.7 mm). The blade cannot be seen on the X-ray photographs (cf. Perovšek, Milić 2000, Figs. 3: a,b). However, on the back of the tip, where the scabbard is damaged, the blade is visible (Figs. 3: b; 4). It fits the shape of the scabbard very well and forms a narrow point.

DISCUSSION

The length of the scabbard from Ljubljana, its proportions and its elongated point are indicative of a late-republican date (cf. Feugère 1993, 140). Its characteristic net-like fitment finds its closest parallel in a sword with a scabbard from Magdalensberg (Carinthia, Austria), which was found in a burnt layer dated by associated finds (including early *sigillata*) to the period c. 30-20 B.C. This badly preserved iron sword, with a fragmentary tang, measures 65,2 cm in its scabbard (the length of the blade is 53.5 cm, its max. width 5.0 cm, and its width in the middle is 4.2 cm). The scabbard was formed of two wooden halves covered with leather. It had copper alloy mounts as follows: a fitment 1.1 cm high at its mouth, two ribbed transverse fitments with loops for rings, a guttering terminating in a pelta-shaped knob, and a cage-like fitment at the tip (Dolenz 1998, 49-53, Fig. 19; Pl. 1: M1). The length of the cage-like fitment shown on the reconstruction in Dolenz 1998, Fig. 19 is speculative, due to the poor state of preservation of the scabbard, and it might have been shorter. A fragment of the upper part of a similar cage-like mount, 6.2 cm wide, is known from Sisak/*Siscia* in Croatia (Hoffiller 1912, 120, Fig. 51; Košćević 1995, 18, Pl. 32: 299).³ That it had probably been attached near the tip of the sword-scabbard, is indicated by the character of the second cross-bar, which is distinctly narrower than

³ Hoffiller (*loc. cit.*) and Remza Košćević (*loc. cit.*) describe it (erroneously in my opinion) as a fitment from a dagger-sheath. There is no evidence for the dating of this fitment, other than typology (cf. Franzius 1999, who erroneously writes of this fitment "wird einem Dolch aus dem 1. Jahrhundert zugeordnet").



Fig. 11: The front of the upper half of the sword in its scabbard.

Sl. 11: Zgornji del meča, spredaj.



Fig. 12: The back of the upper half of the sword in its scabbard.

Sl. 12: Zgornji dela meča, zadaj.

the upper one. The tip of the sword⁴-scabbard from the Roman ship found at Comacchio (Invernizzi 1990, 100, 101 - Fig. 4, 260, 261, Pl. 68: 229), dated to soon after 12 B.C. (Berti 1990, 72-75), was also decorated with a similar fitment. Recently a sword-scabbard with unusual silver fitments has

been published from Kalkriese (Franzius 1999). It has a cage-like fitment on its tip (Frazier 1999, 578-581, 594-597, Figs. 11; 16) which closely resembles that on the Sisak example (see above). On the latter, the openwork decoration has a circle in the same position as the prestigious Kalkriese example

⁴ According to the original publication of the material from the Comacchio ship (Berti et al. 1990), the finds included a short sword and a dagger (Invernizzi 1990, 101). The decorated wrist-guard (Invernizzi 1990, 101, 258, Pl. 68: 227) and two suspension rings (Diam. 2.4 and 2.7 cm) belong to the badly preserved sword. The second weapon (now lost) was not found at the same location as the sword, and was identified as a dagger from its length. According to the report (Invernizzi 1990, 101), it had a wooden scabbard and two copper-alloy transverse fitments with loops and rings for suspension (Diam. 1.5 cm), as well as a net-like mount and knob. On the photograph of this find *in situ* (o.c., p. 100, Fig. 4; no scale), the lower part (?) of a scabbard with a transverse fitment with a loop on each side can be seen, but no indications of the net-like fitment can be recognised. However, it would be unusual to find such transverse mounts on a Roman dagger (cf. Bishop, Coulston 1993, 74-79; Feugère 1993, 163-166). Any understanding of the complexities is made even more difficult by the use of different scales, none of which is given by the author (Invernizzi 1990, Pl. 68). Feugère (1993, 265) published the fragments of the sword and the "dagger" as the remains of a single sword.



Fig. 13: The unusual fittings on the back of the scabbard.
Sl. 13: Nenavadni okovi na hrbtni strani nožnice.

has a precious gem. This sword-scabbard belongs chronologically with the rest of the finds from Kalkriese, which are dated to A.D. 9, the year of the Varran disaster (Franzius 1999, 598-599, 607). All these “cages” were probably positioned on the tips of the scabbards and were not riveted to them but attached by folding the ends of the transverse rods around the edges and pressing them against the back of the scabbard.⁵

The method of sword suspension which utilizes rings attached to loops on two transverse fittings is typical of *gladii* of Mainz (and later Pompeian) type. However, it also characterises the much earlier Celto-Iberian daggers/short swords, which probably influenced the form of the *gladius hispaniensis* (Quesada Sanz 1997, Fig. 156: 1; Stary 1994, 134, Pls. 7: 3e; 12: 2a etc.), and the few Roman late-republican swords known (eg. Delos - see below; Mouriès, dated to c. 100 B.C.⁶; Ornavasso, S. Bernardo, Grave 31, dated to the period between 90/80 and 40 B.C. by Martin-Kilcher 1998, 243). Though the rings do not survive on the Ljubljana scabbard, it may be assumed that they once existed. Nevertheless, these fittings clearly differ from the “classical” ones, as well as from those on the scabbard from Magdalensberg, and on that from Berry-Bouy “Fontillet”. The last comes from a grave dated to c. 20 B.C. (Ferdrière, Villard 1993, 135, Fig. 2-45; Feugère 1994, Fig. 10: 2), though it may have been an heirloom in its context (Feugère 1994, 11). The transverse fittings from the Ljubljana are narrower, not ribbed, positioned on the back

of the scabbard, and are not wrapped around it, but terminate on the front and are riveted to the guttering (Figs. 11; 12).

Non-“classical” transverse fittings, which are not wrapped around their scabbard but terminate on the back, occur on a sword from Giubiasco, Grave 119, which has a wooden scabbard with copper-alloy guttering and fittings (Primas 1992, 475-476, Fig. 4: 1); the *umbo* and the belt-ring (Primas 1992, Figs. 3; 4: 2) from this grave suggest a date in the first half of the first century B.C. (D. Božič, pers. comm.). Unfortunately it is not a very reliable grave-group as it comes from old excavations (Primas 1992, 473-475). Another similar sword from Ornavasso, Persona, Grave 97 (Graue 1974, 262, Pl. 73: 8), dated to between 40 and 20/15 B.C. (Martin-Kilcher 1998, 205, 243), casts doubt on the early dating of the sword from Giubiasco.

No analogies can be found for the rectangular fitting with the two holes, which protruded from the back of the scabbard (Fig. 13). In spite of the much later date of Pompeian-type swords, they should be mentioned here. Two of the scabbards of this type (from *Pompeii* and *Poetovio*) still have their fittings surviving between the transverse mounts with loops for rings (Ulbert 1969, 117-118, Pl. 18:1b,28b). Ulbert (1969) described them as wide bands of “bronze”, bent to form a sling, with the ends pushed under the guttering and riveted to it. He assumed that these swords were attached to the *cingulum* (belt) with this “additional” fitting at the back of the scabbard, but the rings through the loops of the transversal mounts would have been attached to the *balteus*. On the other hand, a slide on the back of the scabbard, albeit longitudinal, is a characteristic feature of La Tène sword sheaths.

The animal-head terminals (preserved only on one side of the mount at the front of the Ljubljana scabbard) are similar to the handle-ends of Pescate-type ladles, probably produced in Italy. These are characteristic of graves dating from the end of the second to the middle of the first century B.C., though some examples have been found in later contexts (cf. Castoldi 1991, 65-67, Figs. 3-9; Petrovsky 1993, 27-28).

The length of the Ljubljana scabbard (65 cm) is similar to that of the Delos scabbard, which was found in a layer dated to 69 B.C. Calculating from

⁵ Franzius (1999, 596) assumed that the transverse cross-bars of the Kalkriese scabbard had probably been riveted to the guttering at the back of the scabbard, but this seems improbable, in view of the analogous examples from *Siscia*, Magdalensberg, Comacchio and Ljubljana.

⁶ Feugère (1993, 99) mentions the possibility of a fastening mechanism with transverse fittings with loops, as four rings were found near the sword; he has suggested (pers. comm.) that further research into the context is needed.

the published drawings, it measures 62 cm and the sword with the handle measures 76 cm in length (Siebert 1987, 637, Figs. 17-19). The scabbard and the blade (6.0 and 5.3 cm at the mouth) appear relatively wide in comparison with the example from Ljubljana (5.5 cm at the mouth of the scabbard; the blade is estimated at 4.5 cm between the transverse mounts). From this, it is evident that the taper of the scabbard from Delos is more marked than that of the Ljubljana sheath. According to the description and the schematic drawing of the Delos sword made before its restoration, the scabbard was of leather, and held together with *iron* guttering (not depicted) and with iron bands around it. Two narrow transverse iron fitments, each with a suspension ring survived, but it is not clear how they were fixed to the sheath.

The use of brass (*aurichalcum*) for the mounts on the scabbard from Ljubljana

Brass, an alloy of copper and zinc, occurs very frequently on decorative metalwork used by the military (Craddock, Lambert 1985, 164), so in this context, the results of the analyses of the fitments of the Ljubljana scabbard are not surprising. But the period to which this scabbard should be dated, i.e. to about the beginning of the second half of the first century B.C., initially seemed to be rather early for the use of brass, as the first extensive use of this metal in Italy and the west, has generally been associated with the coinage reform of Augustus in 23 B.C. (cf. Giunlia-Mair 1996, 52). The argument is of major importance for the dating of the sword and scabbard under discussion, so it will be described in some detail.

The deliberate manufacture of brass by the cementation process⁷ began in the first decades of the first century B.C. in Asia Minor. The earliest known brass coins were made for Mithradates VI and are dated to c. 75-65 BC. In the provinces of Asia, Bithinia-and-Pontus and Cilicia, brass began to be used frequently for coins by about 50 B.C. At the mint of Rome, bronze coins were made from their introduction in the third century B.C. until about 80 B.C. Thereafter, with one or two possible exceptions, the Rome mint produced no bronze coins (only silver ones) until the reign of Augustus. In about 23 B.C., Augustus instigated coinage reform; he produced a new base metal coinage,

and introduced the new metals, brass/*aurichalcum* (for *sestertii* and *dupondii*) and copper (for asses). Even so, brass had already been used earlier for a fairly small issue made by Caesar's *praefectus Clovius* in 46-45 B.C, probably in Cisalpine Gaul (Burnett, Craddock, Preston 1982, 263-268). So the inception of the Augustan monetary reform should not be equated with the beginning of the use of brass in Roman Italy. This being so, the occurrence of brass fitments on a scabbard dated to about the beginning of the second half of the first century B.C. should occasion no surprise.

For the analyses of metallurgy the PIXE method was chosen because most of the fitments are very thin and do not provide enough material for other types of analysis such as ICP (inductively coupled plasma spectrometry), which would probably provide more accurate results (cf. Šmit, Pelicon 2000). With this method the surface of the object is analysed. An additional reason for choosing a non-destructive analytical technique was the unique nature of the object.

These analyses showed that all the fitments on the scabbard were made of brass with a zinc content of c. 15-20%. The differences in the percentage of zinc were recorded at different points of the same fitment (cf. Šmit, Pelicon 2000, Fig. 1: 1, 18 and 9, 21, 22), which seem to reflect the variability of the surface. The percentage of lead could be estimated at less than 1%. The estimate of the tin content (0.5-2%) is less accurate (for details cf. Šmit, Pelicon 2000). The majority of Roman fresh cementation brasses, unadulterated with scrap bronze, seem to contain about 20% of zinc, little lead and small amount of tin (cf. Jackson, Craddock 1995, 93; Craddock, Lambert 1985, 164). Given the method used for the metal analyses of the fitments under discussion, it is difficult to draw firm conclusions about the purity of the brass used, but it seems that even if the fitments were not all made of fresh cementation brass, only small amounts of scrap bronze had been added.

CONCLUSIONS

When set alongside its closest parallel, that is the sword in its scabbard from Magdalensberg, the Ljubljana scabbard seems to be earlier because of its general shape (it is longer and narrower, and the point is more pronounced), and the form

⁷ In this process finely divided copper is heated in the presence of the zinc ore, i.e. zinc oxide or carbonate, and charcoal in a closed crucible (Craddock 1995, 296; Bayley 1990, 9-11).

and positioning of its transverse fitments, with the loops and animal-head decoration. The example from Ljubljana may be seen as the typological predecessor of the early-Augustan scabbard from Magdalensberg.

The fitments from Kalkriese however, show us that net-like decoration only on the tips of scabbards was still in use in the late Augustan period. It may be tentatively suggested that the use of a cage-like fitment on the tip of a scabbard, such as is known from Sisak, Comacchio, Kalkriese and probably also from Magdalensberg, developed typologically from the use of a cage-like fitment on the whole front of the scabbard, as is exemplified by the Ljubljana scabbard. It seems that cage-like scabbard decoration was merely a side-shoot of their general development, as it does not seem to have influenced the classical Mainz-type *gladii*. But the technique of suspension, and the general shape of these swords and scabbards evidently evolved in the same general direction.

In particular, the sword and scabbard from Delos provide only a general parallel for the shape; though the scabbards are of approximately the same length, the one from Delos seems wider.

There are other pre-Augustan Roman finds from the Ljubljana, for example, *simpulum* with a ver-

tical handle with a wolf-head terminal (Svoljšak et al. 1994-1995, 260-261, Pl. 17: 2; Božič 1999, 199) and a helmet of Etrusco-Italic type (Logar, Svoljšak 1988, 1-2; Guštin 1990, 132, Fig. 4: 7; Guštin 1991, 53, Fig. 28: 7).

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Rimski poznorepublikanski gladij iz Ljubljance

Prevod

OKOLIŠČINE NAJDBE

Narodni muzej Slovenije je 1993 pridobil tri dele meča v nožnici (inv. št. V 1366): zgornji del, spodnji del in odlomek robnega okova (cf. Perovšek, Milič 2000, sl. 1; 2). Pokrit je bil z debelo in trdo plastjo rečnih sedimentov, ki so bili strokovno odstranjeni (cf. Perovšek, Milič 2000).

Meča ni našel arheolog. Ležal je na rečnem dnu, okoli 50 m nizvodno od izliva kanala Hočevarica (sl. 1) in približno 2,5 km od Dolgih njiv na Vrhniku (*Nauportus*; sl. 2). Meč je ležal ob velikem kamnu blizu rečnega brega. Ob odkritju je bil že prelomljen, zgornji in spodnji del pa je še povezovala podolgovata os mrežastega okova.¹

OPIS MEČA IN NOŽNICE

Zdi se, da je ohranjena celotna dolžina meča brez ročaja. Zgornji in spodnji del meča se namreč na odlomljenem mestu dobro prilegata (sl. 3; 4). Nožnica je 65 cm dolga in 5,5 cm široka (merjeno med robnima okovoma na najširšem delu, tj. ustju). Je razmeroma dolga, z dolgo konico. Morebitni ostanki ročaja so korodirali v brezoblično gmoto, prepojeno z rečnimi sedimenti. Na rentgenski fotografiji (cf. Perovšek, Milič 2000, sl. 3: a) sledovi trna ročaja niso vidni.

Nožnica je bila narejena iz dveh lesenih oplat, sprednje in zadnje, iz orehovega ali morda javorjevega lesa.² Speti sta bili z robnim okovom U-preseka, ki se prične 4 mm pod ustjem nožnice in se nepretrgano nadaljuje do konice. Ta se zaključuje z ovalnim gumbom. Analize kovin na površini s PIXE metodo na osmih mestih so pokazale, da je ta okov skupaj s konico narejen iz medenine (baker in 15-20 % cinka;³ cf. Šmit, Pelicon 2000, 184, tab. 1 in sl. 1: točke 4, 13, 20-24). Na hrbtni strani zgornjega dela nožnice so zgoraj vidni morebitni ostanki usnja (sl. 12; Perovšek, Milič 2000, sl. 7).

Robni okov je bil izdelan iz petih ali sedmih kovanih delov, ki so bili spajkani na štirih ali morda šestih mestih. Tri so

ohranjena: simetrično na obeh straneh, kjer je pritrjen spodnji prečni okov (sl. 5; 6), in na odlomku robnega okova (sl. 7), ki je najverjetneje ležal tako, da je mesto spoja ležalo približno 10 cm pod zgornjim mestom spajkanja, malo nad sredino nožnice. Za ta odlomek in za zgornje desno mesto spoja so analize kovin dale naslednje rezultate: medeninast robni okov je bil z zlitino kositra (približno 69 oz. 75 %) in svinca (približno 21 oz. 12 %; cf. Šmit, Pelicon 2000, tab. 1 in sl. 1: točki 1, 12) prispajkan na okoli 3 cm dolgo, enako kot robni okov uvito podlogo iz brona (približno 92 % bakra in 6 % kositra; cf. Šmit, Pelicon 2000, tab. 1 in sl. 1: točka 17). Robni okov spodnje polovice nožnice je bil narejen v enem kosu skupaj z gumbom na koncu nožnice ali pa je bil morda še enkrat spajkan na konici približno 11 cm nad njenim zaključkom, kjer ni ohranjen (cf. sl. 10).

Na sprednjem delu nožnice je mrežast okov, sestavljen iz navpične paličaste osi in vodoravnih prečk (sl. 3: a; 4). Na križiščih navpične osi s prečkami je bil okov okrašen s po štirimi pari žlebičev. Posebej umetelno je okrašeno zgornje križišče, v katerem se navpična os razdeli v dve prečki. Os ni bila enotno profilirana. Približno v sredini med križišči je bila zgoraj in spodaj sploščena in s po dvema paroma prečnih žlebičev ločena od nadaljevanja osi, ki ima na zgornji strani podolžno reberce. Presek z rebercem v bližini križišč kažejo tudi prečke.

Mrežasti okov na nožnico ni bil prikovan, temveč so bile prečke zapognjene čez robni okov in stisnjene ob nožnico (sl. 3: b; 4). Navpična os in štiri prečke so bile narejene v enem kosu, druga in četrta prečka (sl. 8; 9) pa sta bili izdelani posebej in ležita pod osjo, na katero sta prikovani ter prispajkani z zlitino kositra (okoli 55 %), svinca (približno 26 %) in bakra (približno 13 %? - verjetno iz medenine v okolici; cf. Šmit, Pelicon, tab. 1 in sl. 1: točka 8). Pod sedmim križiščem (sl. 10) je bil na enak način pritrjen na navpično os deltoiden okov na konici. Analiza površine mrežastega in deltoidega okova na treh točkah je pokazala na medenino s približno 15-18 % cinka (cf. Šmit, Pelicon 2000, tab. 1 in sl. 1: točke 7, 10, 16, 19).

¹ Podatke je posredoval najditelj.

² Ostanke lesa je analizirala dr. Metka Culiberg, Biološki inštitut Jovana Hadžija, ZRC SAZU, Ljubljana.

³ Štiri meritve so pokazale razmeroma enotno vsebnost cinka 18,2-20 %, v eni točki pa le 14,9 % cinka.

Na hrbtni strani ležita, okoli 9,8 cm narazen, dva približno 7 cm dolga prečna okova (sl. 12). Zapognjena sta čez robni okov na sprednjo stran nožnice (sl. 11), tako da na obeh straneh tvorita zanke, v katere je bilo mogoče vdeti obročke za obešanje nožnice. Prikovana sta na robni okov. Analiza kovine na površini je pokazala na medenino s 17-19 % cinka (cf. Šmit, Pelicon 2000, tab. 1 in sl. 1: točki 6, 15).

Pod zgornjim prečnim okovom je na hrbtni strani nožnice nenavaden okov (sl. 12). Je pravokotne oblike in se v vogalih zoži v trakove. Ti so zapognjeni čez robni okov in so se zaključili na sprednji strani v obliki živalskih glav, ki so ohranjene le na levi strani (sl. 11). V sredini tega okova je približno 6,5 mm široka okrogla luknja, iz katere moli masivna zanka z dve-ma luknjama (sl. 13). Na rentgenski fotografiji, ki kaže vzdolžni profil meča v tem delu (Perovšek, Milič 2000, sl. 5: a), se jasno vidi, da ni bila umeščena globoko v leseni del nožnice, kot smo pričakovali, pač pa sega 2-3 mm pod tanek okov, v katerega je vdeta skozi luknjo, in se rahlo razširi. Iz dodatne rentgenske fotografije (Perovšek, Milič 2000, sl. 5: b; 6) je razvidno, da zanka tudi v prečni (vodoravni) smeri ni bistveno širša od luknje na tankem okovu, zato ni razumljivo, kako je bila ta zanka pritrjena na nožnico. Analize kovin na površini okova in zanke so pokazale, da sta narejena iz medenine (delež cinka na površini znaša 15,5 do 18,6 %; cf. Šmit, Pelicon 2000, tab. 1 in sl. 1: točke 5, 14, 18).

V obstoječem stanju meča ni mogoče potegniti iz nožnice. Železno rezilo meča je vidno na desnem robu pod zgornjim prečnim okovom in še nekoliko niže (sl. 3: a; 4). Tu lahko ocenimo njegovo širino na največ 4,5 cm. Na enako ali rahlo ožje rezilo meča kaže razdalja med zakovicami, s katerimi sta prečna okova pritrjena na robni okov (4,8 in 4,7 cm). Rezilo je deloma vidno tudi na konici, kjer je nožnica na hrbtni strani poškodovana (sl. 3: b; 4). Tu se rezilo dobro prilega obliki nožnice in tvori ozko konico. Na rentgenski fotografiji rezila ni mogoče videti (cf. Perovšek, Milič 2000, sl. 3: a,b).

DISKUSIJA

Dolžina in oblika nožnice iz Ljubljance ter njena izrazita konica kažejo na njen nastanek v predavgustejskem času (cf. Feugère 1993, 140). Značilen mrežast okov ima najboljšo analogijo v meču z nožnico s Štalenske gore. Ta je bil najden v žganinski plasti, ki je po drobnih najdbah (predvsem zgodnji sigilati) datirana v obdobje med približno 30 in 20 pr. n. š. Je slabo ohranjen. Z delom ročajnega trna in nožnico meri 65,2 cm (dolžina rezila 53,5 cm, največja širina 5,0 cm, širina v sredini 4,2 cm). Nožnica je bila sestavljena iz dveh lesenih stranic, ki sta bili prekriti z usnjem, in je imela naslednje okove iz neopredeljene bakrove zlitine: 1,1 cm visok okov na ustju, dva narebrena prečna okova z zankami za obročke, robni okov, ki

se na konici zaključijo s pahljačastim gumbom, in mrežast okov na konici (Dolenz 1998, 49-53, t. 1: M1). Višina mrežastega okova, kot je prikazana na sl. 19 citiranega dela, je hipotetična. Del podobnega, 6,2 cm širokega mrežastega okova, je bil najden v Sisku (Hoffiller 1912, 120, sl. 51; Koščević 1995, 18, t. 32: 299).⁴ Verjetno je bil pritrjen na konico nožnice, saj je spodnja prečka zaznavno ožja od zgornje. Nožnica bodala ali meča⁵ iz rimske ladje, potopljene kmalu po letu 12 pr. n. š. pri Comacchii (Invernizzi 1990, 100, 101 - sl. 4, 260, 261, t. 68: 229), je bila prav tako okrašena s podobnim mrežastim okovom. Pred kratkim so bili objavljeni srebrni okovi nožnice iz Kalkrieseja (Franzius 1999). Na konici te nožnice je bil mrežast okov (Franzius 1999, 578-581, 594-597, sl. 11; 16), ki zelo dobro ustreza primerku iz Siska: okrogel okrasek na zgornji prečki okova iz Siska na prestižnem primerku iz Kalkrieseja nadomešča dragocena gema. Časovno se ta nožnica vklaplja v ostale najdbe s tega najdišča, ki so datirane v leto 9 n. š., t. j. leto Varovega poraza (Franzius 1999, 598-599, 607). Mrežasti okovi iz Siska, Kalkrieseja, Comacchia in verjetno tudi s Štalenske gore so bili na konicah nožnic in niso bili prikovani na nožnico, temveč pritrjeni tako, da so bile prečke okova zapognjene preko robnega okova in pritisnjene ob hrbtno stran nožnice.⁶

Pritrjevanje nožnice na pas s pomočjo obročkov, vdetih v zanke na dveh prečnih okovih, je značilno za gladije tipa Mainz (in kasneje tipa Pompeji), pa tudi za dosti starejše keltsko-iberske kratke meče oz. bodala, ki so verjetno vplivali na obliko zgodnjega rimskega meča, tj. *gladius hispaniensis* (Quesada Sanz 1997, sl. 156: 1; Stary 1994, 134, t. 7: 3e; 12: 2a itd.), in za redke znane poznorepublikanske meče (npr. Delos - glej dalje, Mouris, datiran okoli 1. 100 pr. n. š.,⁷ in Ornavasso, S. Bernardo, grob 31, ki ga Martin-Kilcher 1998, 243 datira v obdobje med 90/80 in 40 pr. n. š.). Obročki na nožnici iz Ljubljance niso ohranjeni. Prečna okova na tej nožnici se močno razlikujeta od "klasičnih", pa tudi od okovov na mečih s Štalenske gore in iz groba Berry-Bouy - "Fontillet". Ta je sicer datiran okoli 20 pr. n. š. (Ferdrière, Villard 1993, 135, sl. 2-45; Feugère 1994, sl. 10: 2), vendar je me morda pre itek (Feugère 1994, 11). Okova na nožnici iz Ljubljance sta ožja, nista narebrena, ležita na hrbtni strani nožnice in se zaključita na sprednji strani ter sta prikovana na robni okov (sl. 11; 12).

"Neklasične" prečne okove, ki ne objemajo cele nožnice, poznamo tudi z meča z leseno nožnico in z "bronastim" robnim in drugimi okovi iz groba 119 iz Giubiasca (Primas 1992, 475-476, sl. 4: 1). Ščitna grba in pasna spona iz tega groba (Primas 1992, sl. 3: 2; 4: 2) kažeta na njegovo datacijo v prvo polovico 1. st. pr. n. š. (za opredelitev se zahvaljujem Draganu Božiču). Žal grobna celota ni povsem zanesljiva, saj izvira iz starih izkopavanj (Primas 1992, 473-475). Podoben meč iz groba 97 v Ornavassu, Persona (Graue 1974, 262, t. 73: 8), ki ga je Stefanie Martin-Kilcher (1998, 205, 243) datirala v obdobje med 40 in 20/15 pr. n. š., kaže na nezanesljivost datacije meča iz Giubiasca.

⁴ Po Hoffillerju in Koščeviću je ta okov pripadal nožnici bodala. Časovno ga lahko opredelimo le po tipoloških kriterijih (cf. Franzius 1999, ki napačno navaja za ta okov "*wird einem Dolch aus dem 1. Jahrhundert zugeordnet*").

⁵ V originalni objavi najdb z ladje, potopljene pri Comacchii (Berti et al. 1990), je zapisano, da sta bila tam najdena bodalo in meč (Invernizzi 1990, 101). Ornamentiran okrogli branik (Invernizzi 1990, 101, 258, t. 68: 227) in obročka za obešanje (premer 2,4 in 2,7 cm) pripadajo slabo ohranjenemu meču. Drugo orožje (sedaj izgubljeno) je bilo najdeno na drugem mestu kot meč in so ga zaradi dolžine opredelili kot bodalo. Iz poročila (Invernizzi 1990, 101) izhaja, da je imelo leseno nožnico in dva prečna okova z zankami in obročki za obešanje (premer 1,5 cm), mrežast okov in gumb iz bakrove zlitine. Na fotografiji te najdbe *in situ* (o. c., 100, sl. 4; brez merila) je viden spodnji del (?) nožnice s prečnim okovom in zanko na obeh straneh (ne pa ostanki mrežastega okova). Tak prečni okov je za rimsko bodalo nenavaden (cf. Bishop, Coulston 1993, 74-79; Feugère 1993, 163-166). Razumevanje komplicirane situacije je v objavi še dodatno oteženo z uporabo različnih merih (ki pa niso navedena) na t. 68 v Invernizzi 1990. Feugère (1993, 265) je ostanke "bodala" in meča objavil kot ostanke enega samega meča.

⁶ Domneva Georgie Franzius (1999, 596), da so bile prečke mrežastega okova pri nožnici iz Kalkrieseja prikovane na hrbtno stran nožnice, je po primerjavi z nožnicami iz Siska, s Štalenske gore, iz Comacchia in iz Ljubljance malo verjetna.

⁷ Feugère (1993, 99) omenja možnost pritrjevanja s prečnimi okovi z zankami za obročke, ker so bili zraven meča najdeni štirje obročki, ustno pa me je opozoril, da bo treba zadevo še natančno preučiti.

Za nenavadno masivno zanko z dvema luknjama, ki moli iz hrbtne strani nožnice (*sl. 13*), nismo našli ustreznih primerjav. Zanke na hrbtne strani nožnice, med prečnima okovima za obešanje, so ohranjene tudi na dveh nožnicah tipa Pompeji, in sicer z eponimnega najdišča in iz Petovione (Ulbert 1969, 117-118, t. 18:1b, 28b). Ulbert jih je opisal kot široka "bronasta" trakova, zvita tako, da oblikujeta zanko, njuni konci pa so potisnjeni pod robni okov in nanj prikovani. Domneval je, da so meče tega tipa na cingulum pritrjevali s takim okovom na hrbtu nožnice, na balteus pa z obročki, ki so bili vdeti v zanke na prečnih okovih. Velja pa tudi omeniti, da je navpična(!) zanka na hrbtne strani, namenjena obešanju nožnice, značilnost latenskih mečev.

Zaključki okova v obliki živalskih glav (ohranjeni le na levi strani; *sl. 11*) so podobni zaključkom ročaja zajemalk tipa Pescate. Značilne so za grobove od konca 2. st. do sredine 1. st. pr. n. š., posamezni primerki pa so znani tudi iz mlajših grobov. Izdelovali so jih v Italiji (cf. Castoldi 1991, 65-67, sl. 3-9; Petrovsky 1993, 27-28).

Dolžina nožnice iz Ljublanice (65 cm) je podobna meču z nožnico z Delosa, ki je bil najden v žganinski plasti, datirani v 69 pr. n. š. (Siebert 1986, 637, sl.17-19). Nožnica in rezilo tega meča (6,0 in 5,3 cm na ustju, preračunano po risbi) sta v primerjavi s primerkom iz Ljublanice (širina nožnice 5,5 cm na ustju, širina rezila med prečnimi okovi okoli 4,5 cm) razmeroma široka, zato ni presenetljivo, da je konica nožnice z Delosa manj koničasta od tiste iz Ljublanice. Glede na opis in risbo meča z Delosa pred restavracijo je bila nožnica narejena iz usnja, ki je bilo speto z železnim robnim okovom (na risbi ni viden) in železnimi trakovi, ovitimi okrog nje. Ohranjena sta tudi dva ozka železna okova z obročki za obešanje, vendar ni jasno, kako sta bila pritrjena na nožnico.

Uporaba medenine (*aurichalcum*) za izdelavo okovov na nožnici

Medenino, zlitino bakra in cinka, so pogosto uporabljali na rimskih vojaških predmetih (Craddock, Lambert 1985, 164), zato uporaba medenine za okove na nožnici iz Ljublanice sama po sebi ni presenetljiva. Pač pa se je zdel začetek druge polovice 1. st. pr. n. š., tj. čas, v katerem glede na navedene primerjave domnevamo nastanek obravnavanega predmeta, po površnem pregledu literature prezgoden za uporabo te kovine. Avgustovo denarno reformo iz leta 23 pr. n. š. namreč pogosto navajajo kot pričetek široke uporabe medenine v Italiji (npr. Giumlia-Mair 1996, 52). Ker je ta za datacijo meča z nožnico iz Ljublanice izrednega pomena, ga bom širše obravnavala.

Medenino so začeli izdelovati namenoma, s cementacijo,⁸ v prvih desetletjih 1. st. pr. n. š. v Mali Aziji. Najstarejši znani medeninasti novci so bili kovani za Mitridata VI. in so datirani v približno 75 do 65 pr. n. š. Uporaba medenine za izdelavo novcev je postala pogosta v provincah *Asia, Bithynia et Pontus* in *Cilicia* okoli 50 pr. n. š. V kovnici v Rimu so od začetka, t. j. tretjega st. pr. n. š., do okoli 80 pr. n. š. kovali bronaste novce, po tem pa ta kovnica do Avgustove reforme ni izdelovala bronastih, ampak srebrne novce (razen redkih izjem). Leta 23 pr. n. š. je Avgust izvedel denarno reformo: uvedel je novi osnovni kovini, medenino (*aurichalcum*) za sesterce in baker

za ase. Vendar pa so medenino že pred tem uporabili za zelo majhno emisijo, ki jo je l. 46-45 pr. n. š., verjetno v Cisalpski Galiji, izdal Cezarjev prefekt *Clovius* (Burnett, Craddock, Preston 1982, 263-268). Avgustove denarne reforme torej nikakor ne smemo enačiti z začetki uporabe medenine v Italiji. Uporaba medenine za okove na nožnici iz (domnevno) začetka druge polovice 1. st. pr. n. š. potemtakem ni presenetljiva.

Za analizo kovin smo izbrali metodo PIXE, pri kateri je analizirana le površina predmeta, ker je večina okovov tanka in iz njih ne bi bilo mogoče dobiti dovolj snovi za druge analize (npr. ICP), ki bi gotovo dale natančne rezultate (cf. Šmit, Pelicon 2000). Pomemben razlog za izbiro te metode je bila tudi njena nedestruktivnost.

Iz analiz izhaja, da so bili vsi okovi in zanka narejeni iz medenine s približno 15-20 % cinka. Nihanje med navedenimi odstotki je bilo ugotovljeno tudi v okviru istega okova (prim. sl. 1: 5, 18 in 9, 21, 22), kar kaže na stopnjo nehomogenosti površine. Ocenjen delež svinca je manjši od 1 %. Manj natančno je ocenjen delež kositra, ki znaša 0,5-2 % (podrobno cf. Šmit, Pelicon 2000). Večina svežih rimskih medenin, ki so na-stale s cementacijo in jim niso dodali bronca, je vsebovala 20 % cinka ter malo svinca in kositra (cf. Jackson, Craddock 1995, 93; Craddock, Lambert 1985, 164). Ker smo analizirali le površino okovov in zaradi omejene natančnosti metode, ki smo jo uporabili za določitev zlitin, je težko sklepati na čistost uporabljene medenine. Zdi se, da so bili okovi izdelani iz čiste medenine, ali pa so ji morda dodali le majhno količino bronca.

SKLEP

Meč v nožnici iz Ljublanice se zdi starejši od njegove najboljše analogije, t. j. meča v nožnici s Štalenske gore. K temu nas navajajo njegova splošna oblika (je daljši in ožji, konica pa bolj izrazita kot pri meču s Štalenske gore), oblika in lega prečnih okovov z zankami za obešanje ter tudi živalske glavice. Primerek iz Ljublanice je tipološko gledano predhodnik zgodnje-avgustejskega meča z nožnico s Štalenske gore.

Okovi nožnice meča iz Kalkrieseja kažejo, da so bili mrežasti okovi na konicah nožnic rimskih mečev v rabi še v poznoavgustejski dobi. Morda se je mrežast okras na konici nožnice, znan tudi iz Siska, Comacchia in verjetno s Štalenske gore, razvil iz nožnic z mrežastim okovom na celi sprednji strani nožnice, kakršna je poznana iz Ljublanice. Zdi se, da je bil mrežast okras le stranska veja v razvoju okrasa nožnic gladjev, saj ni vplival na nožnice mečev tipa Mainz. Vendar sta se način pritrjevanja nožnice na pas ter splošna oblika teh nožnic razvijala v isti smeri.

Meč z nožnico z Delosa se od primerka iz Ljublanice tako razlikuje, da lahko primerjamo le njuno obliko. Čeprav sta nožnici podobne dolžine, je tista z Delosa širša.

Poleg obravnavanega meča poznamo še druge predavgustejske rimske najdbe iz Ljublanice, npr. zajemalko z navpičnim ročajem, ki se zaključuje z volčjo glavico (Svoljšak et al. 1994-1995, 260-261, t. 17: 2; Božič 2000, 199), in čelado etruščansko-italskega tipa (Logar, Svoljšak 1988, 1-2; Guštin 1990, 132, sl. 4: 7; Guštin 1991, 53, sl. 28: 7).

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⁸ Pri cementaciji so drobne delce bakra segregali v prisotnosti cinkove rude (tj. cinkovega oksida ali karbonata) in oglja v zaprtem kalupu (Craddock 1995, 296; Bayley 1990, 9-11).