Roman bronze helmets from the Republican period and the Early Principate in Slovenia

Rimske bronaste čelade republikanske dobe in zgodnjega principata v Sloveniji

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Izvleček

K rimskim bronastim čeladam poznorepublikanske in zgodnjecesarske dobe v Sloveniji sodi šest čelad, več odlomkov ene čelade, pet vrhnjih delov petih čelad in morda en lični ščitnik. Štiri čelade sodijo k čeladam etruščansko-italskega tipa, med katerimi je najmlajši datiran primerek iz let okrog 70 pr. Kr. Skupaj z gumbom so narejene v enem kosu in na zunanji strani spolirane. Ostale čelade oziroma njihovi deli pripadajo tipoma Buggenum (vrh z gumbom ene čelade) in Haguenau (dve čeladi, dva gumba, dva odlomka z gumbom vrhnjega dela čelad) oziroma prehodu med omenjenima tipoma (ena čelada) in so iz zgodnjega principata.

Z analizami PIXE ugotovljena približna elementna sestava uporabljenih materialov je pokazala, da je osnovni material obravnavanih čelad bron, ki vsebuje srednje veliko kositra (okoli 6 do 12 %) in nič (ali zelo malo) svinca ali drugih elementov. Zanke za pritrditev ličnih ščitnikov so iz brona ali (na eni čeladi) železa. Za zakovice so uporabili baker, pri eni čeladi železo. Medenina in spajkanje se pojavita na čeladah najmlajšega tipa (Haguenau) oziroma na čeladi, ki je na prehodu med tipoma Buggenum in Haguenau.

Ključne besede: Slovenija, rimska doba, čelade, bronaste zlitine, analize PIXE

Abstract

Archaeological sites in Slovenia have yielded a number of Roman bronze helmets from the Late Republican and Early Imperial periods. More precisely, there are six (nearly) complete examples, several fragments of another helmet, five pieces of five different other helmets and possibly a cheek-piece. Four of the helmets belong to the Etrusco-Italic type, with the bowl and knob made in a single piece and with a polished exterior, of which the latest dated example is from around 70 BC. The other helmets or their parts are of the Buggenum (upper part of one helmet with a crest-knob) and Haguenau types (two helmets, two crest-knobs, two upper part fragments with a crest-knob), one also of the transitory form between the two types; all these date to the Early Principate.

The helmets have been subjected to PIXE analyses to determine the approximate elemental composition. The results have shown that the helmets proper are mainly made of bronze with a medium amount of tin (roughly 6 to 12%) and no or very little lead or other elements, the hinges for attaching the cheek-pieces are of bronze and on one helmet of iron, rivets are of copper and on one helmet of iron, while the use of brass and the practice of soldering have been recorded on the helmets of the latest type (Haguenau) and on the helmet of the transitory Buggenum/Haguenau form.

Keywords: Slovenia, Roman period, helmets, bronze alloys, PIXE analyses

INTRODUCTION

The earliest Roman helmets trace their origin to the bronze[1] helmets that began to be produced in Etruria in the 4th century BC.[2] They are known in literature under different names: Etrusco-Italic (knob helmets),[3] Etrusco-Roman,[4] Montefortino type[5] and conical helmets with a crest-knob.[6] They formed part of the Roman armament from the 3rd century BC to the first third of the 1st century BC.[7] In this contribution, I refer to them as Etrusco-Italic helmets.

They also represent the origins of the bronze Buggenum and Haguenau helmets,[8] which the Roman soldiers wore in the second half of the 1st century BC and the first two thirds of the 1st century AD.[9]

The 'missing link' between the Etrusco-Italic and Buggenum helmets are probably the bronze Mannheim helmets, which are without a crest-knob and share a similar decoration with the Etrusco-Italic helmets.[10] Roughly contemporary with and similar (but lighter and almost undecorated) to the Mannheim helmets are those of the Coolus type. It is not certain whether these are Celtic or Roman; part of the known Coolus helmets come from contexts suggesting a connection with the Gauls, while one such helmet was recovered together with other items from a ship that sank around 70 BC at Madrague de Giens (France) and was worn by a Roman soldier.[11]

In the Augustan period, the Romans began using predominantly iron helmets of the Weisenau type alongside the bronze helmets.[12]

Sites in Slovenia have thus far yielded four helmets of the Etrusco-Italic type, one crest-knob of a Buggenum helmet, one helmet of the transitory Buggenum/Haguenau type, as well as two complete examples, five crest-knobs and possibly one cheek-piece of Haguenau helmets. Most of these helmets and their parts have not yet been discussed in detail.

DESCRIPTIONS OF HELMETS[13]

1. Etrusco-Italic helmet from the Ljubljanica

(*Figs. 1–2;* site: *Fig. 18:* 1; *Pl. 1*)

The 1984 underwater archaeological survey in the River Ljubljanica (at Blatna Brezovica, Tri Lesnice site; *Fig. 18:* 1) revealed a bronze helmet (*Pl. 1; Fig. 1*) that is 223 mm high, has a roughly 1 mm thick bowl and weighs 1182 g. It is kept in the Narodni muzej Slovenije (Inv. No. R 18915).[14]

It is made of bronze with approx. 88% copper and 12% tin, without added lead.[15] It has clear forging marks on the interior, which are also well visible on the X-ray image (*Fig. 2*). The bowl is made in a single piece with a hollow crest-knob and a neckguard. The lower part of the bowl and the neckguard show flaws that occurred during the production process.

The exterior was polished and originally probably had an appearance similar to the one achieved after the concluded conservation in 1985 (*Fig. 1a–e*).

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[1] The word bronze is used here to refer to an alloy of copper and tin if positively established or likely. For the undetermined nonferrous alloys, I use the term copper alloy.

[2] Junkelmann 2000, 56; Pernet 2010, 72.

[3] E.g. Feugère 1994a, 37–41; Pernet 2010, 72–75.

[4] Schaaff 1988, 318–322.

[5] Junkelmann 2000, 52–65. The same name is also used to refer to similar Celtic helmets with a separately made knob attached to the top of the helmet (Pernet 2010, 72–73).

[6] E.g. Ortisi 2015, 27.

[7] Schaaff 1988, 318–322, 353, Fig. 3; Egg et al. 1988, No. 110; Feugère 1993, 83–87, 118, 119; Feugère 1994a, 37–41, 43, 45; Feugère 1994b, 10, 12, 20, Fig. 8; Junkelmann 2000, 59, 60; Pernet 2010, 72–75.

[8] Authors often use the German name of the site (Hagenau), which lies at the eastern border of France, in Alsace.

[9] Schaaff 1988, 325, 326, 353, 354; Waurick 1988, 327–333, 350–352; Pernet 2010, 75.

[10] Pernet 2010, 116–122 (with references).

[11] Pernet 2010, 116–122. Contrary to Pernet, I was not able to find any strong indications of the Coolus helmets predating those of the Mannheim type (cf. Pernet 2010, 118, 119, Fig. 83).

[12] Waurick 1988, 333–335, 352, 353; Junkelmann 2000, 68–85; Pernet 2010, 76. Of importance for dating the beginnings of the type is the helmet from Oberaden (Müller 2006).

[13] The designations of left and right in the descriptions take the viewer's point of view, with the object facing the viewer and with its knob (i.e. top) facing upwards.

The results of metal characterisation in the paper are given in mass percentages and were obtained by the method of proton-induced X-ray emission analysis (PIXE). The analytical work was performed by Žiga Šmit on the Tandetron accelerator at the Jožef Stefan Institute in Ljubljana. For details on the apparatus see Istenič 2003, 197. If not otherwise specified, the measurements were taken in places where the patina had been removed.

[14] Istenič 2009b.

[15] The elemental composition of the helmet bowl was measured in two spots: Ni 0.3%, Cu 88.1%, As 0.1 0%, Pb 0.12%, Sn 11.4% and Ni 0.2%, Cu 87.6%, As 0.14%, Pb 0.0 7%, Sn 11.9%. For details see: Šmit, Istenič 2018, C1.

Fig. 1: River Ljubljanica at Blatna Brezovica (helmet Cat. No. **1**). **a** – front; **b** – right side; **c** – back; **d** – left side; **e** – neckguard (detail); **f** – interior, view towards the hollow crest-knob.
Sl. 1: Reka Ljubljanica pri Blatni Brezovici (čelada kat. št. **1**). **a** – spredaj; **b** – desna stran; **c** – zadaj; **d** – leva stran; **e** – vratni ščitnik (detajl); **f** – notranjost, pogled proti votlemu gumbu.
(Photo / Foto T. Lauko, NMS)

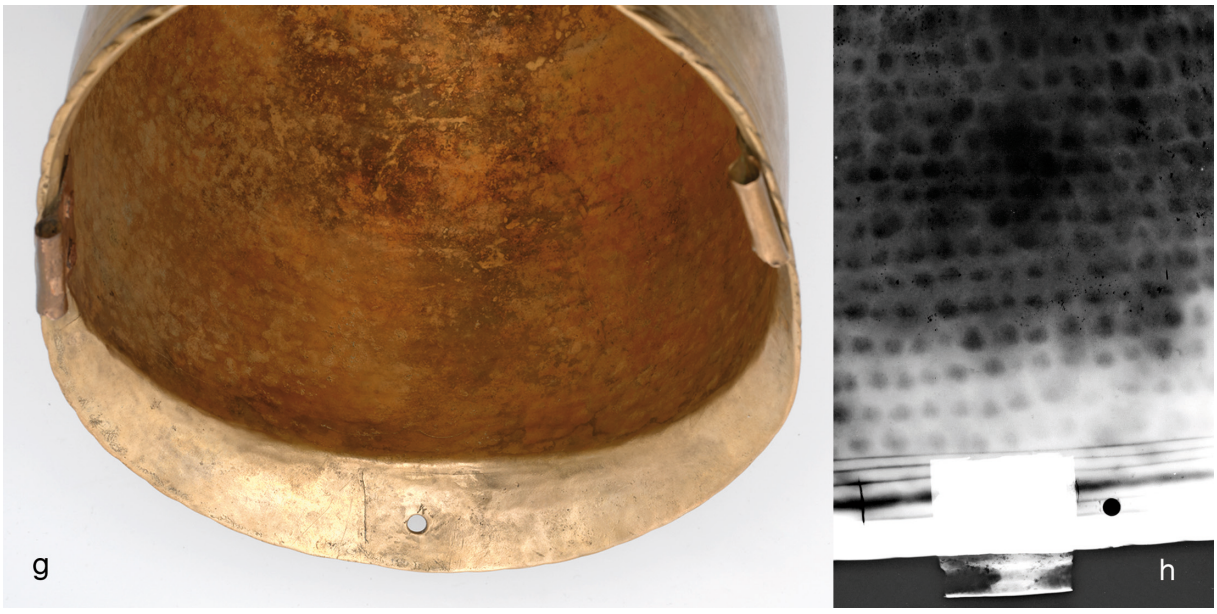


Fig. 2: River Ljubljanica at Blatna Brezovica (helmet Cat. No. **1**). **g** – interior, visible traces of forging and a scratched inscription forming the letter *A*; **h** – X-ray image (100 kV, 4 mA, 30 seconds) with clearly visible forging marks on part of the bowl.
Sl. 2: Reka Ljubljanica pri Blatni Brezovici (čelada kat. št. **1**). **g** – notranjost, vidni so sledovi kovanja in grafit v obliki črke *A*; **h** – rentgenski posnetek (100 kV, 4 mA, 30 sekund) dela kalote jasno kaže, da je bila kovana.
(Photo / Foto T. Lauko, NMS)

The decoration on the crest-knob, along the rim and on the neckguard was made by punching[16] (*Fig. 1a–e*).

There is a 6 mm wide hole in the middle of the neckguard.

Attached to each interior side of the helmet is a hinge made from a piece of sheet bronze; apart from copper, the bronze of the hinges contains 4 and 8% tin, respectively.[17] They are fastened to the bowl with a pair of copper[18] rivets and represent the upper part of the hinges for fastening the cheek-pieces.[19] The loop on the right side holds a piece of the iron axis bar. In front of the hinges, there is a roughly 4 mm wide hole on each side (*Pl. 1*).

In this pair of holes, the item from the Ljubljanica differs from other Etrusco-Italic helmets. Similar holes can only be seen on a helmet of the Montefortino/Canosa subtype from an unknown site, though the holes there are located both in front and behind the hinges.[20]

The underside of the neckguard bears a scratched inscription that probably represents the letter A (*Fig. 2g*), while the interior of the bowl bears a graffito that reads XI (viewed with the knob above the inscription; *Pl. 1*).

2. Etrusco-Italic helmet from Kovačevše
(*Fig. 3;* site: *Fig. 18:* 2; *Pl. 2*)

Numerous fragments of metal, ceramic and glass items spanning from the 5th century BC to the 1st century AD have been found in poorly known circumstances, presumably at Kovačevše, part of the

[16] Description of the punching technique: Braun-Feldweg 1988, 184.

[17] Elemental composition of the left loop: Ni 0.6%, Cu 95.1%, As 0.06%, Pb -, Sn 4.3%; right loop: Ni 0.3%, Cu 91.7%, As 0.35%, Pb 0.08%, Sn 7.6%. For details see: Šmit, Istenič 2018, C1.

[18] Elemental composition of the left rivet: Ni 0.3%, Cu 99.3%, As 0.04%, Pb 0.15%, Sn 0.2%; right rivet: Ni 0.4%, Cu 99.1%, As 0.41%, Pb 0.07%, Sn -. For details see: Šmit, Istenič 2018, C1.

[19] Cf. the Etrusco-Italic helmets with surviving cheek-pieces, e.g. Junkelmann 2000, 58, 59 and Junkelmann, Thüry 2000, 94–96, Figs. 7, 8, 11, 27, Pls. 1–3, Cat. Nos. AG 193, AG 323, AG 425, AG 441.

[20] Born 1991, Pl. 13; Junkelmann, Thüry 2000, 106, Fig. 29.

Fig. 3: Kovačevše in Lokavec (?) (fragments of helmet Cat. No. **2**). Pieces positively ascribed to the helmet **a–e: a** – crest-knob; **b** – fragment of the front; **c,d** – neckguard; **e** – fragment with lower part of the bowl and rim (cf. drawn reconstruction, *Pl. 2*). Other, unmarked pieces may also be parts of the bowl. Visible traces of intentional breakage, deformation and fire damage.
Sl. 3: Kovačevše v Lokavcu (?) (odlomki čelade kat. št. **2**). Zanesljivo so del čelade odlomki **a–e: a** – vrhnji gumb; **b** – odlomek sprednjega dela; **c,d** – vratni ščitnik; **e** – odlomek roba s spodnjim delom kalote (prim. risarsko rekonstrukcijo, *t. 2*). Preostali (neoznačeni) odlomki so morda del kalote. Vidni so sledovi namernega razbitja in deformiranja ter poškodb od ognja.
(Photo / Foto T. Lauko, NMS)

village of Lokavec northwest of Ajdovščina.[21] They show traces of intentional breakage and deformation, as well as fire damage, which suggests that the items originate either from an offering place[22] or from cremation burials. The metal fragments include those of a helmet.[23]

Four rim and bowl fragments, as well as a crest-knob certainly belong to the same helmet (*Fig. 3a–e;* reconstruction on *Pl. 2*). They are kept in the Goriški muzej (knob, Inv. No. 16, *Pl. 2:* a; neckguard fragment, Inv. No. 43, *Pl. 2:* d) and the Narodni muzej Slovenije (front rim fragment, Inv. No. P 12969a, *Pl. 2:* b; rim and bowl fragment, Inv. No. P 12969b, *Pl. 2:* e; large neckguard fragment with a rivet hole, Inv. No. P 12970, *Pl. 2:* c).

The fragments are made of a copper alloy with roughly 10% tin.[24] In addition, the helmet might also be ascribed one large and numerous smaller, heavily deformed and fire damaged fragments, the thickness of which varies from 0.7 to 1.4 mm (*Fig. 3*).[25]

The crest-knob is hollow (th. at the neck 1.3 mm) and bears punched decoration on the exterior (*Fig. 3a; Pl. 2*).

The decoration on a fragment of the thickened rim shows that this particular piece was located in the middle of the front side (*Fig. 3b; Pl. 2*). Two other fragments fit together to form a large part of the neckguard (*Fig. 3c,d; Pl. 2*). Its rim has a trapezoid field, decorated with punched dots at midpoint and flanked on both sides by punched oblique lines running in opposite directions, thus forming a cable pattern, which can be seen on all the surviving rim fragments of the helmet; on the neckguard it is bordered above by a pair of parallel horizontal lines of punched dots. There is also an irregular (roughly lozenge-shaped) and approximately 5 × 6 mm large hole in the middle of the neckguard (*Fig. 3c*).

Two fragments make up part of the rim on one of the bowl sides; bowl thickness varies between 1.1 and 1.5 mm (*Fig. 3e; Pl. 2*).

3. Etrusco-Italic helmet from the area of Sv. Anton

(*Fig. 4;* site: *Fig. 18:* 3; *Pl. 3*)

This bronze helmet (*Fig. 4*) was probably found at a hillfort near Sv. Anton, though the circumstances of its discovery are poorly known.[26] The

[21] Svoljšak 1983, 5, 6. The items were found in a pit that archaeologists investigated in 1945; it seems likely that the pit with prehistoric and Early Roman items was actually dug in the 20th century (shortly before 1945?) and that the items deposited in it were collected in the surrounding area (Svoljšak, pers. comm. on 30 August 2017).

[22] Gleirscher 2002, 258, Cat. No. 187; Božič 2011, 262.

[23] Svoljšak 1983, 19, 20, 23, Nos. 11, 42, 43, 116–118, Pl. 5: 153–157 (the publication lacks the specification that the descriptions of Nos. 116 and 117 correspond with the drawings in Pl. 5: 157 and Pl. 5: 155); Guštin 1991, 22, 23, 52, Pl. 42: 2.

[24] Elemental composition of fragment P 12969: Fe 0.31%, Ni 0.11%, Cu 88.7%, As 0.11%, Sn 10.8%, Pb -; fragment P 12970: Fe 0.31%, Ni 0.17%, Cu 89.5%, As 0.08%, Sn 9.9%, Pb -.

[25] Goriški muzej, Inv. Nos. 39, 40. Part of the pieces kept in this museum certainly does not belong to a helmet (e.g. moulded fragment and a fragment with a small hole and an indicated second hole – the two holes are too small and too close to one another to have been the holes for the rivets of a cheek-piece hinge).

[26] Archäologie und Münzkabinet, Universalmuseum Joanneum GmbH, Inv. No. 10077 (later new Inv. No.: 18102). The inventory book (for Inv. No. 10077) states that the helmet was found at *S. Antonius bei Pirano*, while the publication in the *Jahresberichte Joanneum* 1900 (p. 32) reports where the item was found (*gefunden zu St. Antonius bei Pirano*), but also that the helmet was purchased.

Reinecke (1942, 190–191, Fn. 132) supposed that the helmet was found at the *15 km südlich von Triest gelegene Monte S. Antonio*, on which Marchesetti (1903, 73) mentioned a poorly surviving site: "*Ben poco, come dissi, si conservò del castelliere di S. Antonio, posto al di sopra dell'omonimo villaggio (357 metri). Ridotto in buona parte a coltura, le sue cinta sono quasi complettamente distrutte, sicchè non è possibile rilevarne la forma. Solo i cocci disseminati scarsamente per i campi, ci fanno fede dell'esistenza dell'uomo preistorico*."

The hillfort mentioned by Marchesetti lies on a 356 m high hill south of the village of Dvori and approx. 2 km southeast of the village of Sv. Anton (Truhlar 1975). Modern maps do not state the name of the hill, while the locals refer to it as Sv. Anton or Hrib (source: letter by Matej Župančič, dated 21 May 1997; kept in the archives of the Inštitut za arheologijo ZRC SAZU, Ljubljana (*Arheološki kataster Slovenije: ARKAS* ID 040109.11 [http://arkas.zrc-sazu.si]).

Reinecke offered no supporting evidence for his supposition. It is not impossible that the helmet originates from the hillfort north of Sv. Anton, from the hill of Kortina (257 m asl) that revealed a triple rampart, prehistoric pottery sherds, a bronze dagger from the beginning of the Bronze Age, as well as Roman building remains (drystone walls, roof tiles, bricks) and a water cistern (Strenar, Šribar 1974). It is also not possible to exclude the possibility that the name of the hill with the remains of a hillfort changed after World War II. Such a possibility at Sv. Anton and its surroundings is indicated by the information in *KLS* I

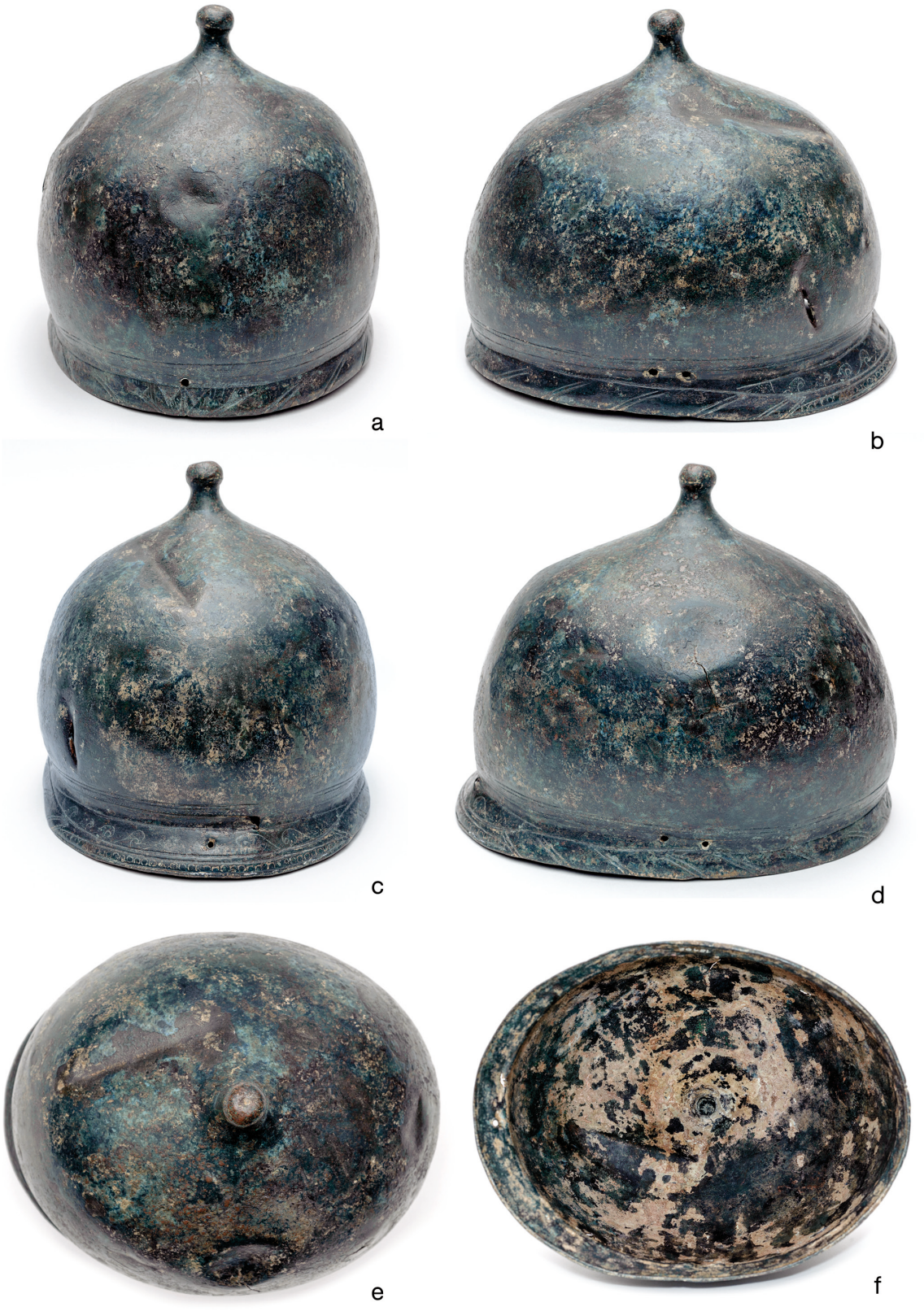


Fig. 4: Area of Sv. Anton (helmet Cat. No. **3**). **a** – front; **b** – right side; **c** – back; **d** – left side; **e** – top; **f** – interior.
Sl. 4: Okolica Sv. Antona (čelada kat. št. **3**). **a** – spredaj; **b** – desna stran; **c** – zadaj; **d** – leva stran; **e** – zgoraj; **f** – notranjost.
(Photo / Foto T. Lauko, NMS)

204 mm high helmet weighs 916.3 g. It is kept in the Universalmuseum Joanneum in Graz, Austria.

It is made in a single piece together with the hollow crest-knob. It has not yet been subjected to conservation. The exterior surface is covered with an uneven patina (brown, dark green-brown and small patches of intensely green) and in parts with a beige calcareous sinter (reacts with HCl solution). In the parts with a dark green-brown patina, the surface is very smooth, which indicates polishing.

On the interior, calcareous sinter covers a much larger part of the surface; it is thickest in the crest-knob and on the upper part of the bowl. There is at least one patch with a dark green-brown patina with a smooth surface. It is possible to discern forging marks that run horizontally from the knob down; forging is consistent with the uneven thickness of the bowl.

The helmet suffered several blows: at the back on the right (approx. 65 mm long straight indentation), above the neckguard, where the bowl is pierced in the length of about 2 cm (the bowl is less than a millimetre thick here), and on the left side (shallow indentation caused by a blunt object); the bowl also has a crack along the middle of the left side.

The crest-knob is undecorated and has a roughly 3 mm wide and 1 mm deep hole in the centre.

There are six holes at the rim: a pair of holes is on the left and right sides, one hole is above the thickened rim roughly in the middle of the front and another one is roughly in the middle of the neckguard. The holes measure around 4 mm across.

All decoration is made by punching.

The bowl bears three parallel grooves that delimit and separate two bands of oblique lines; the lines in the lower band form a herringbone pattern.

The rim of the bowl and the narrow neckguard are thickened (th. approx. 3 and 2 mm). Except for the central parts of the neckguard and the front, the rim is decorated with unevenly spaced pairs of oblique lines forming a cable pattern. At the front, they meet to form a trapezoid field filled with tiny lines. At the back, the rim of the neckguard bears a row of ring-and-dots flanked above and below by grooves, above which is a wave pattern (*Wellenranke*; *Fig. 4c*), with each wave (on the right side, where they are best preserved) bordered by lines and filled in with dots. There are five waves on one side and only three on the other (very little survives of the last wave); the waves run towards the midpoint of the neckguard.

Reinecke claimed (without offering any arguments) that the helmet from the former collection of Franz von Lipperheide (according to Schaaff found in Istria) was unearthed at the same site as the helmet kept in the Joanneum in Graz.[27]

4. Etrusco-Italic helmet from Grad near Krn

(*Figs. 5–9;* site: *Fig. 18:* 4)

The helmet (*Fig. 5*) recently found at Grad, near the village of Krn in the valley of the River Soča,[28] is heavily deformed.[29] The uneven green and green-grey patina on the surface shows that it was exposed to fire. The 204 mm high helmet weighs 746 g and is made of a copper alloy with roughly 6% tin.[30] It is kept in the Tolminski muzej, Tolmin (Inv. No. TM 2650) and has not yet been subjected to conservation. It is made in a single piece. The inside shows forging marks, while the

(141–142): *Pridvor, prejšnji Sv. Anton pri Kopru* (translated as 'Pridvor, previously Sv. Anton near Koper').

Moreover, it is not clear whether the helmet was found in the village of Sv. Anton (less likely) or on the hill of the same name in the vicinity. The information in *Jahresberichte Joanneum* 1900, 32 (*zu St. Antonius*) does indicate the village, but it is also true that in those days a nearby village was often cited as the actual findspot.

[27] Reinecke 1942, 190, 191, Fn. 132; Schaaff 1988, 525, Cat. No. 109.

[28] At this (previously unknown) site, unauthorised individuals using a metal-detector have found numerous items from the Late Hallstatt and Late La Tène periods; they include several copper alloy vessels (among them two situlae from the late part of the Early Iron Age and an Idrija type jug (dating between the second half/last third of the 2nd century and 80/60 BC – cf. Fn. 143), jewellery ('bronze' basket-shaped pendants, bracelet fragments, glass beads with layered eyes) and presumably many iron objects that include two fragments of Late La Tène swords (LT D1), a fragment of a Late La Tène sword scabbard (LT D1) and three fragments of Late La Tène swords in their scabbards (LT D1), Late Hallstatt socketed and shaft-hole axes, Late La Tène shaft-hole axes and numerous spearheads. The finds are kept in the Tolminski muzej and the Narodni muzej Slovenije. Cf. Laharnar, Turk 2017, 170, Fig. 197.

[29] Christoph Steidl Porenta (Ljubljana), a gold and silversmith skilled in the traditional techniques who produces unique pieces of jewellery, believes that the deformation was caused by a great force, possibly by a heavy object placed on top of the helmet lying on its side. Similar, but even greater and intentional damage has been observed, for example, on the Early La Tène helmet from Vasella di Domegge in Veneto, Italy (Marzatico, Gleirscher 2004, 681–682, Cat. No. 8.25).

[30] The alloy was analysed in one spot; elemental composition: Fe 0.16%, Ni -, Cu 93.9%, As -, Sn 5.86%, Pb 0.10%.

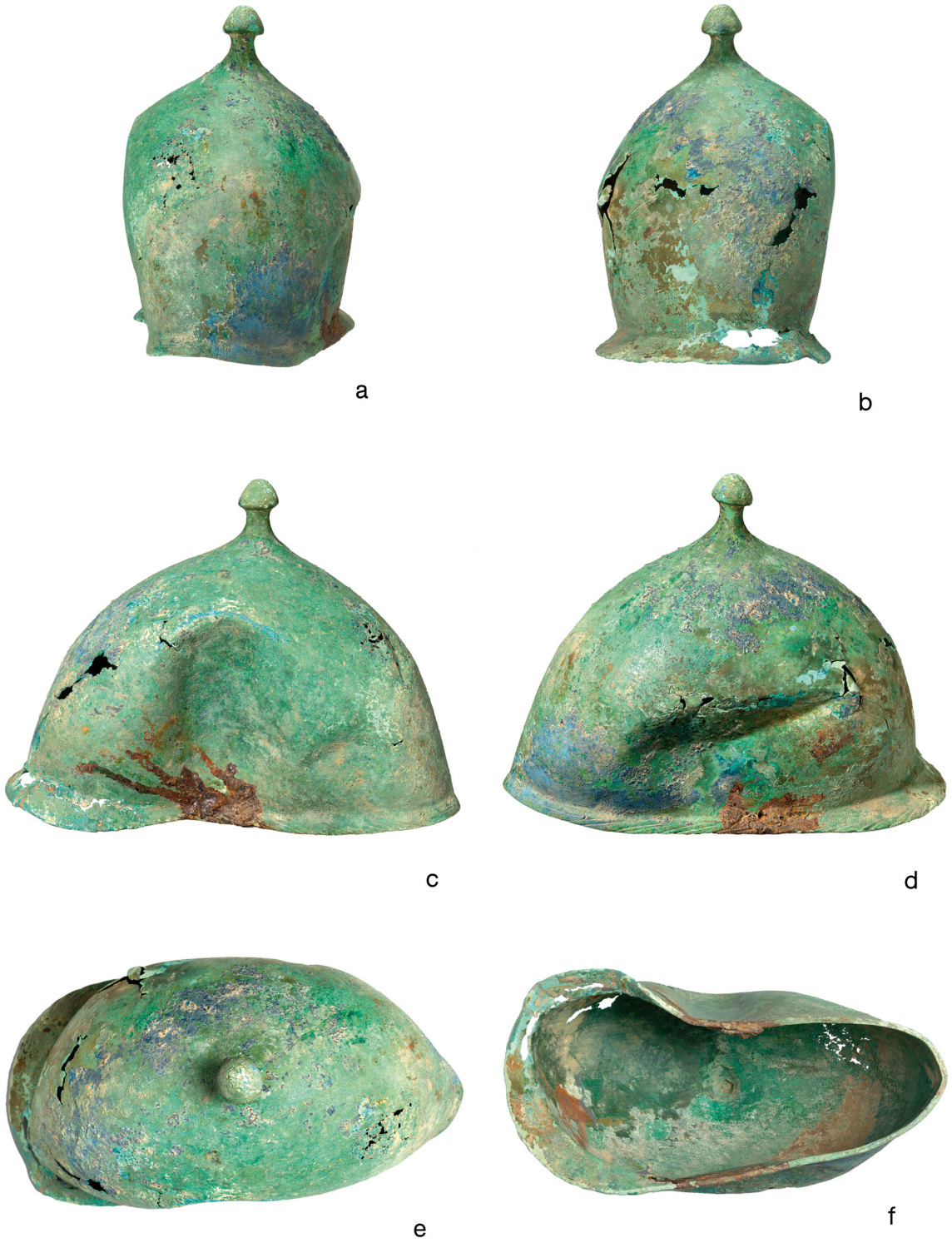


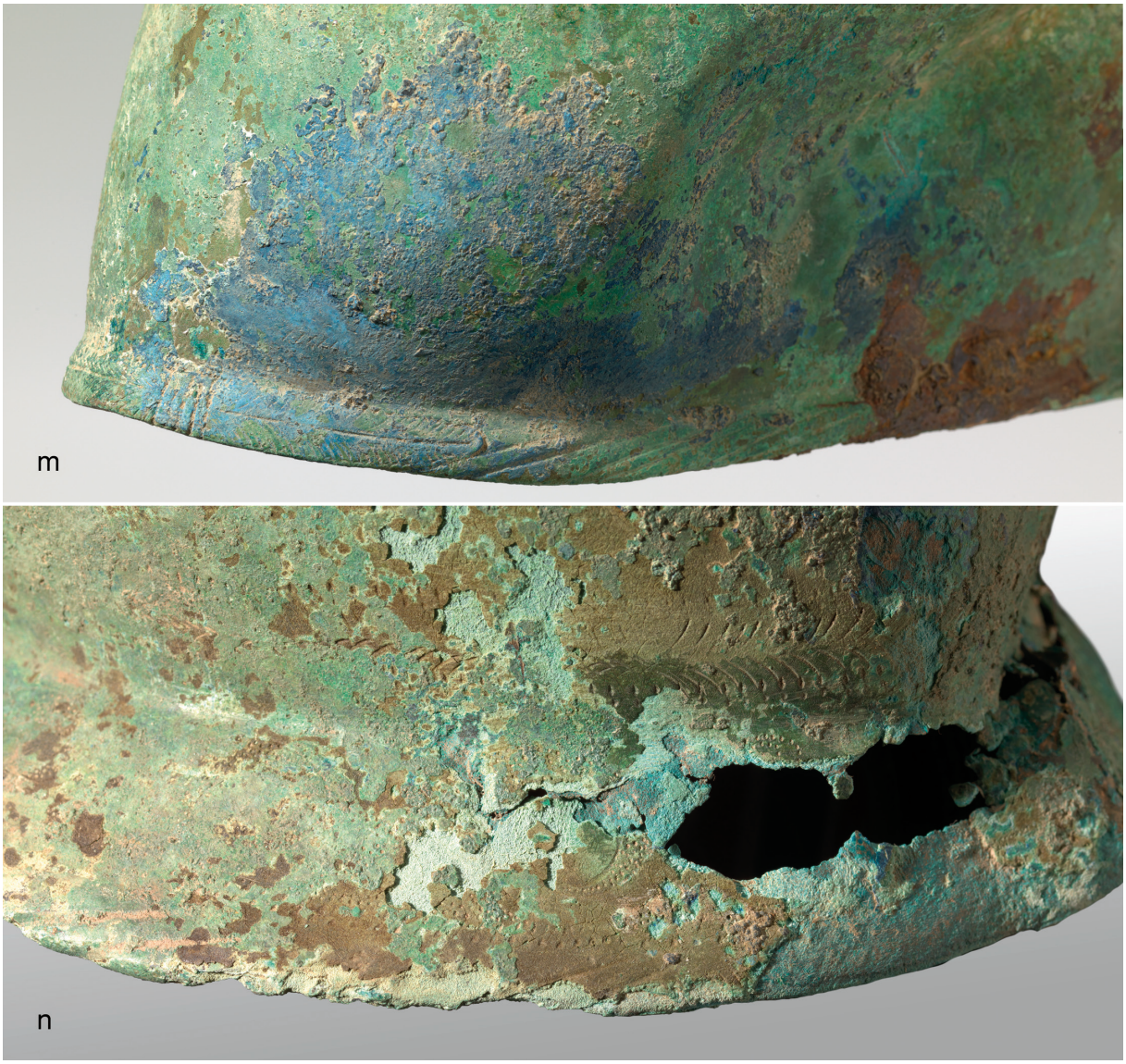
Fig. 5: Grad near Krn (helmet Cat. No. **4**). **a** – front; **b** – back; **c** – left side; **d** – right side; **e** – top; **f** – interior.
Sl. 5: Grad pri vasi Krn (čelada kat. št. **4**). **a** – spredaj; **b** – zadaj; **c** – leva stran; **d** – desna stran; **e** – zgoraj; **f** – notranjost.
(Photo / Foto T. Lauko, NMS)


g
h
i
j
k
l

←

Fig. 6: Grad near Krn (helmet Cat. No. **4**), details. **g** – punched decoration on the crest-knob; **h** – remains of rivets fastening the hinge on the right side; **i** – decoration on the front rim; **j** – remains of rivets fastening the hinge on the left side and punched decoration above the bowl rim; **k** – traces of the hinge and rivets on the right side; **l** – traces of the hinge and rivets on the left interior side.
Sl. 6: Grad pri vasi Krn (čelada kat. št. **4**), detajli. **g** – punciran okras na obodu gumba; **h** – ostanki zakovic, ki sta pripenjali zanko na desni strani; **i** – okras na robu spredaj; **j** – ostanki zakovic, ki sta pripenjali zanko na levi strani, in punciran okras ob spodnjem robu kalote; **k** – sledovi zanke tečaja in zakovic na desni notranji strani; **l** – sledovi zanke tečaja in ostanki zakovic na levi notranji strani.
(Photo / Foto T. Lauko, NMS)

Fig. 7: Grad near Krn (helmet Cat. No. **4**), details. **m** – decoration on the front rim; **n** – remains of the wave pattern roughly in the middle of the neckguard.
Sl. 7: Grad pri vasi Krn (čelada kat. št. **4**), detajli. **m** – okras na robu spredaj; **n** – ostanek okrasa valovite vitice približno v sredini vratnega ščitnika.
(Photo / Foto T. Lauko, NMS)



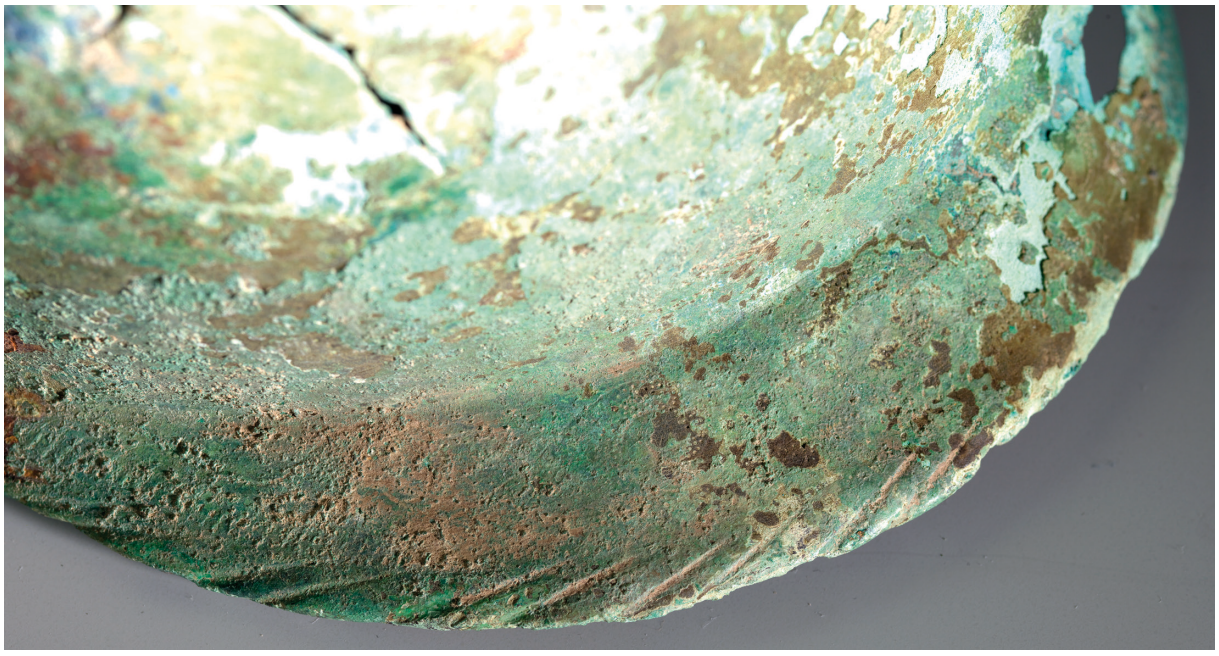


Fig. 8: Grad near Krn (helmet Cat. No. **4**), detail. Remains of the wave pattern on the neckguard and cable pattern on the lower part of the bowl.
Sl. 8: Grad pri vasi Krn (čelada kat. št. **4**), detajl. Ostanki okrasa valovitih vitic na vratnem ščitniku in punciran okras na spodnjem delu kalote.
(Photo / Foto T. Lauko, NMS)

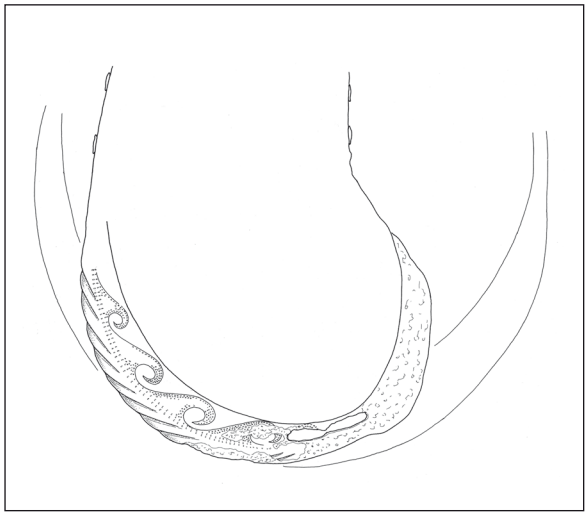


Fig. 9: Grad near Krn (helmet Cat. No. **4**). Reconstruction of the neckguard decoration. (Scale = 1:3).
Sl. 9: Grad pri vasi Krn (čelada kat. št. **4**). Rekonstrukcija okrasa na vratnem ščitniku (M. = 1:3).
(Drawing / Risba I. Murgelj, NMS)

outside bears traces of polishing that are poorly visible even under a microscope.

The bowl is very thin (less than 1 mm) and terminates at the top in a roughly 24 mm wide crest-knob that bears minute punched decoration along the perimeter (*Fig. 6g*).

The neckguard is 28 mm long; it begins immediately behind the spot where the hinges are attached and gradually widens.

The rim (including that on the neckguard) is thickened (max. th. approx. 4.5 mm) and decorated: the front bears a 106 mm long symmetric punched decoration (vertical lines in the middle, flanked left and right by a sprig or palm leaf motif with a pronounced central line; *Fig. 6i*), flanked on both sides by variously long (approx. 10 do 38 mm) punched oblique lines that form a cable pattern on the neckguard (*Figs. 6h,j; 7m; 8*). Roughly 6 mm above the thickened rim of the bowl on the front and on both sides, as well as at the back above the line of the neckguard, is a roughly 11 mm high band of slightly curved and symmetrically positioned oblique lines that form a herringbone pattern (*Fig. 6i*).

On the neckguard, there are poorly discernible remains of a punched wave pattern (*Figs. 7n; 8*) above the short, roughly 3 mm long oblique punched lines forming the cable pattern above the rim (surviving on the right; *Fig. 5d*). On the left side of the neckguard, this decoration is visible

in several spots that show the pattern in that part to be composed of four waves oriented towards the middle of the neckguard. Each wave is filled with punched dots and bordered on one side by a punched line. The poorly preserved part of the punched decoration near the middle (*Figs. 7n; 8; 9*) suggests that the centre of the neckguard, probably above the rivet hole, was decorated with a different motif (not waves) made in the same technique of punched dots and lines.

The magnet test showed that the remains of the hinge loop (for attaching the cheek-pieces) on the left interior side of the helmet (*Fig. 6l*) and the two pairs of rivets with roughly 10 mm wide heads (*Fig. 6h,j,k*) that fastened the loop to the bowl are iron. This observation is confirmed by the iron rust surviving on these spots both inside and outside. The surviving part of the loop and its traces on the surface of the bowl show that the loop was originally approx. 51 mm long and reached approx. 22 mm high onto the bowl (estimated metal sheet th.: 2–3 mm).

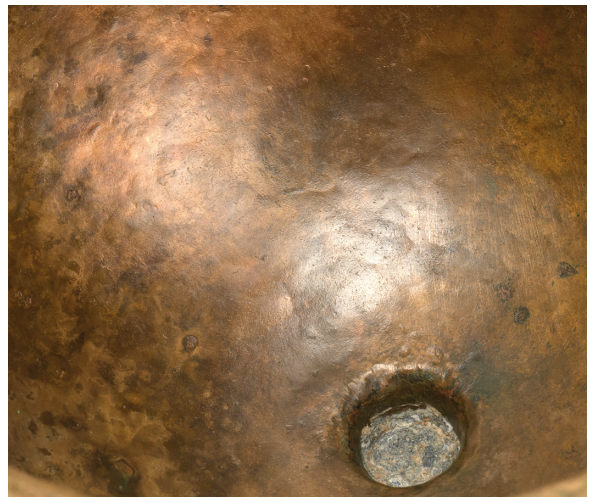


Fig. 10: River Ljubljanica at Vrhnika (helmet Cat. No. **5**), detail of the interior. Visible forging marks.
Sl. 10: Reka Ljubljanica pri Vrhniki (čelada kat. št. **5**), detajl notranjosti. Vidni so sledovi kovanja.
(Photo / Foto T. Lauko, NMS)

5. Buggenum/Haguenau helmet from the Ljubljanica

(*Figs. 10–12;* site: *Fig. 18:* 5; *Pl. 4*)

The River Ljubljanica at Vrhnika yielded a 193 mm high helmet that weighs 1136 g and has a roughly 1 mm thick lower part of the bowl.[31] It is made of bronze with approx. 10% tin.[32] It is kept in the Narodni muzej Slovenije (Inv. No. V 1950).

The bowl, crest-knob and neckguard were made in a single piece. Running circularly on the inside of the bowl, from the knob downwards, are forging marks (*Fig. 10*); forging is confirmed by the X-ray image (*Fig. 12h*). There are two cracks on the knob (*Fig. 11a,d*), which probably occurred during the production process. Regular parallel horizontal traces on the exterior show that the surface here was polished (e.g. with pumice) on the wheel.

The crest-knob has a vertical V-sectioned slot and, in the sides, a pair of horizontal perforations that conically narrow towards the interior of the knob without reaching the slot (*Pl. 4*). The knob is filled with a hard grey substance (*Figs. 10; 11f;*), which is most likely a lead-tin alloy.[33]

The rim of the bowl is thickened.

There are no traces to suggest that the helmet had a browguard.

At the sides and the back (*Fig. 11b–d*), a tin-lead alloy[34] was used to solder the two plume tubes of pure brass (around 22% and 14% zinc, respectively[35]) to the bowl.

Two hinges are attached to the sides on the rim interior (*Fig. 11b,d*) by way of pairs of copper[36] rivets; they were meant to hold the cheek-pieces

[31] Istenič 2009i, 306, 307, Cat. No. 76.

[32] The elemental composition of the bowl was measured in one spot: Fe 1.7%, Ni 0.3%, Cu 87.2%, As 0.14%, Pb -, Sn 10.5%. For details see: Šmit, Istenič 2018, C2.

[33] The proton beams could not reach the dark grey substance in the knob and its elemental composition was estimated from the bits obtained by scraping some of the substance and wiping the scrapings with a piece of cotton wool. The results indicate an alloy of lead and tin, in which lead is probably predominant. For details see: Šmit, Istenič 2018, C2.

[34] The measurements show that the welding has a 1 : 1 ratio of tin and lead. For details see: Šmit, Istenič 2018, C2.

[35] One measurement was taken on each of the plume tubes. Left tube: Fe 1.3%, Ni 0.2%, Cu 75.0%, Zn 22.4%, As 0.08%, Se -, Pb 0.25%, Ag 0.2 5%, Sn 0.25%; right tube: Fe -, Ni 0.2%, Cu 76.1%, Zn 23.2%, As -, Se -, Pb 0.07%, Ag 0.11%, Sn 0.4%; elemental composition of the plume tube at the back: Fe -, Ni 0.1%, Cu 85.5%, Zn 14.0%, As 0.03%, Se 0.11%, Pb 0.11%, Ag 0.04%, Sn 0.2%. For details see: Šmit, Istenič 2018, C2.

[36] Results of the measurements of two rivets: Cu 99.2 and 99.4%. For details see: Šmit, Istenič 2018, C2.


a
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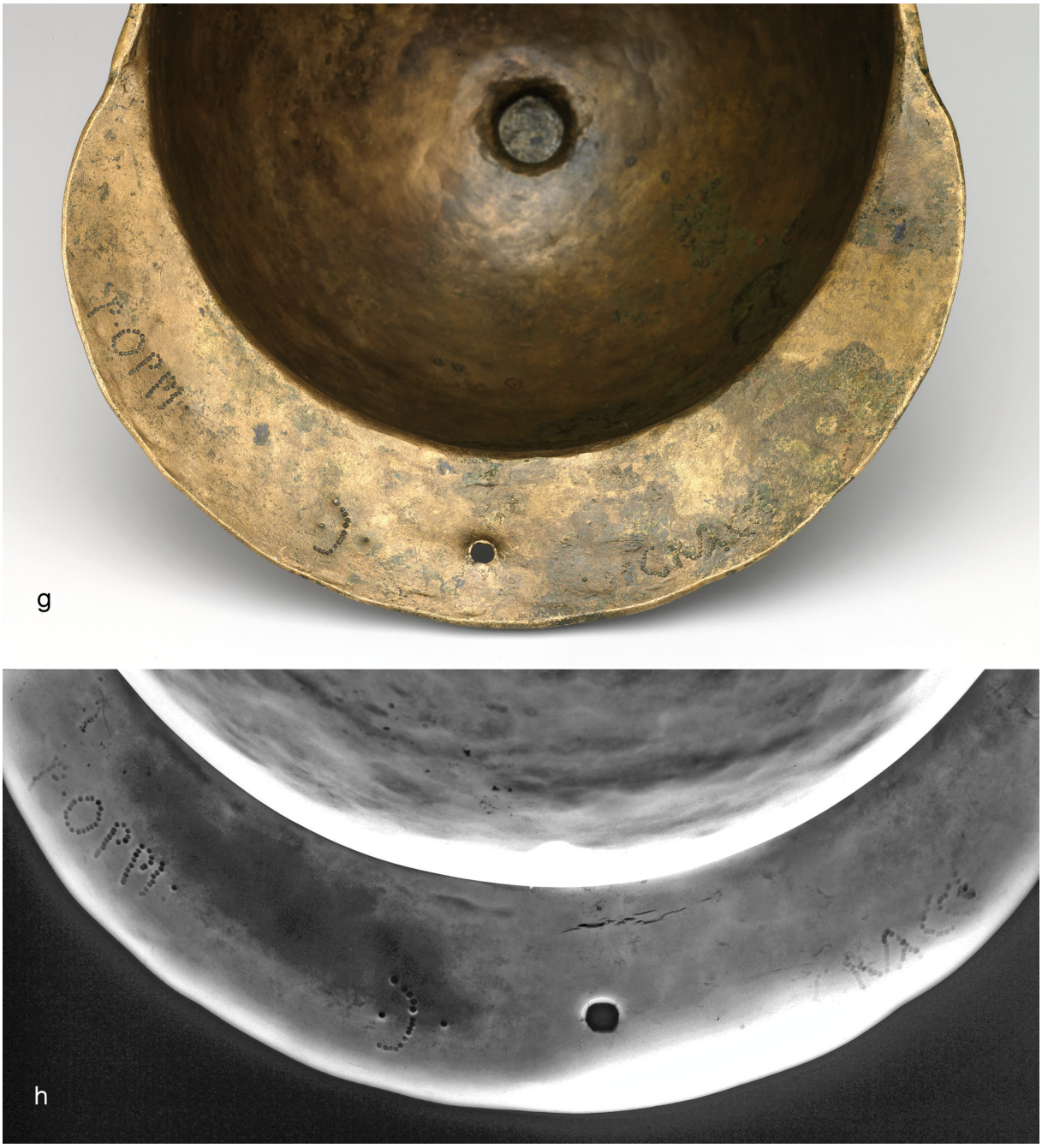

Fig. 12: River Ljubljanica at Vrhnika (helmet Cat. No. **5**), detail. **g** – inscription on the neckguard underside; **h** – X-ray image (100 kV, 4 mA, 25 seconds) of part of the bowl and the inscribed neckguard.
Sl. 12: Reka Ljubljanica pri Vrhniki (čelada kat. št. **5**), detajl. **g** – napis na spodnji strani vratnega ščitnika; **h** – rentgenski posnetek (100 kV, 4 mA, 25 sekund) dela kalote in vratnega ščitnika z napisom.
(Photo / Foto: [g] T. Lauko, NMS; [h] S. Perovšek, NMS, J. Vodišek, Inštitut za metalne konstrukcije, Ljubljana).

←

Fig. 11: River Ljubljanica at Vrhnika (helmet Cat. No. **5**). **a** – front; **b** – left side; **c** – back; **d** – right side; **e** – view from above; **f** – interior.
Sl. 11: Reka Ljubljanica pri Vrhniki (čelada kat. št. **5**). **a** – spredaj; **b** – leva stran; **c** – zadaj; **d** – desna stran; **e** – pogled od zgoraj; **f** – notranjost.
(Photo / Foto T. Lauko, NMS)

and were cut out of sheet bronze with roughly 5% tin.[37] There is iron rust in the right hasp of the hinge – probably the remains of the iron pivot bar. The cheek-pieces have not survived.

The underside of the neckguard bears a punched inscription P. OPPI > CRACCI (*Fig. 12g*).

The hole in the middle of the neckguard (*Fig. 11e*) marks the spot where the fitting with a ring for helmet suspension would have been riveted to the neckguard.

6. Haguenau helmet from Mušja jama near Škocjan

(*Fig. 13;* site: *Fig. 18:* 6; *Pl. 5*)

The bronze helmet from the cave of Mušja jama near Škocjan[38] (*Fig. 13; Pl. 5*) was found on top of a conical pile of stones mixed with prehistoric votive offerings (11th–8th century BC).[39] It is 203 mm high and kept in the Civico Museo di Storia ed Arte Trieste (Inv. No. 40760).

The bowl has two distinct indentations, one at the back and the other on the right side. The surface bears an uneven dark green patina and in several spots a rough grey layer, presumably sinter.

The bowl has thin walls (th. approx. 1 mm) and a thickened rim (th. 3–4 mm). The interior shows clear traces of (uneven) forging. The exterior is markedly smooth in the places with a well-preserved patina, which indicates polishing.

The crest-knob was made integrally with the bowl, it is hollow (*Fig. 13f*) and has very thin walls (roughly as thin as the bowl). The heavy damage to the right side caused it to lose its original form here and to break at the neck. The knob has a roughly 26 mm deep V-sectioned vertical slot which has a barely discernible circular cut at the top. Left and right of the slot are roughly 12 mm deep horizontal perforations that cut through the metal sheet (*Pl. 5*). On the front of the bowl, there are two roughly 4 mm wide holes above the rim (*Fig. 13a,d*), which were punched from the exterior and are not positioned completely symmetrically to the central axis of the bowl; they served to fasten the browguard (now missing).

Attached to the rim of the bowl on the left and the right sides are two probably bronze (the material does not visually differ from that of the helmet) rivets (*Fig. 13b,d*) that once held the hinges for fastening the cheek-pieces (now missing). The rivets have low D-sectioned heads and shanks measuring roughly 4 mm in diameter that reach some 5 mm to the interior of the helmet (*Fig. 13f*). On the interior, there are no traces of the hinges.

The surface above the rivets on the left side has a roughly 40 × 28 mm large and coarse grey patch (*Fig. 13b*) that presumably represents sinter.

The shallow-angled neckguard widens outwards. It holds two 4 and 6 mm wide holes that were punched from the underside and not completely symmetric with regards to the central axis of the helmet (*Fig. 13c*); their function is unclear.

The neckguard also has a heavily corroded surface approximately in the middle, both on the upper and undersides (*Figs. 13c,f,g*; approx. 18 × 20 mm on the upper side), which probably represents the remains of an iron rivet. It probably held the fitting (now missing) with a suspension ring attached to the underside.

Other holes on the neckguard most likely occurred during the decaying process.

The upper side of the neckguard bears two punched inscriptions (*Fig. 13g; Pl. 5*): .>.CAESIDIENI.C.TOMIVS (along the bowl rim) and .>.POSTVMI.M.VALERI.BACINI (along the exterior neckguard rim). The letters and dots of the inscription along the exterior rim are larger than those of the inscription at the bowl. The letters A and L (in Valeri) are partially covered by rust produced by the iron rivet in the middle of the neckguard. The helmet has not been X-rayed.

[37] Results of the measurements on two spots: Fe -, Ni 0.5%, Cu 93.5%, Zn -, As 0.19%, Se -, Pb 0.44%, Ag -, Sn 5.4% and Fe 1.9%, Ni 0.6%, Cu 92.2%, Zn -, As 0.18%, Se -, Pb 0.37%, Ag -, Sn 4.7%. For details see: Šmit, Istenič 2018, C2.

[38] Szombathy 1912, 168, 169, Figs. 180, 181; Kubitschek 1912; Degrassi 1929, 177–179 = Degrassi 1962,742–745, four photographs on the figure between pp. 436 and 437; Marzatico, Gebhard, Gleirscher 2011, 371, 647, Cat. No. 7.27; Maggi 2005; Vidulli Torlo 2008; Borgna et al. 2016, 672, Pls. 68, 86. Kept in the Civico Museo di Storia ed Arte Trieste, Inv. No. 40760.

[39] Teržan 2016, 405, 406.

Fig. 13: Mušja jama near Škocjan (helmet Cat. No. **6**). **a** – front; **b** – left side; **c** – back; **d** – right side; **e** – top; **f** – interior; **g** – punched inscriptions on the neckguard underside side of the neckguard.
Sl. 13: Mušja jama pri Škocjanu (čelada kat. št. **6**). **a** – spredaj; **b** – leva stran; **c** – zadaj; **d** – desna stran; **e** – zgoraj; **f** – notranjost; **g** – puncirana napisa na spodnji strani vratnega ščitnika.
(Photo / Foto Civico Museo di Storia ed Arte Trieste)


a
b
c
d
e
f
g

Fig. 14: River Sava at Mokrice (helmet Cat. No. 7). **a** – back; **b** – left side; **c** – interior; **d** – right side; **e** – inscription on the upper side of the neckguard, detail.
Sl. 14: Reka Sava pri Mokricah (čelada kat. št. 7). **a** – zadaj; **b** – leva stran; **c** – notranjost; **d** – desna stran; **e** – napis na zgornji strani vratnega ščitnika, detajl.
(Photo / Foto Hrvatski povijesni muzej)

7. **Haguenau helmet from the Sava at Mokrice (?)**
(*Fig. 14;* site: *Fig. 18:* 7; *Pl. 6*)

This bronze helmet was found in the River Sava at Mokrice (*Fig. 14*) and is now kept in the Hrvatski povijesni muzej (Inv. No. 31408).[40] The relatively heavy (wgt. 1470 g) helmet is 150 mm high. Its bowl has unevenly thick walls (0.5–1.5 mm) and a thickened rim. The helmet is well-preserved, though the bowl is deformed in several places – most distinctly as an indentation on the right side. It has a markedly brown and green patina, underneath which are clear traces of forging on the interior.

The knob is missing. There are no traces of plume tubes or solder that fixed them at the sides and the back. On the right, there is a hinge loop for a cheek-piece. The loop was cast of a copper alloy. Its interior holds the remains of the axis bar (*Pl. 6*) – the thick patina prevents us from determining whether it was made of iron or copper alloy. The loop is fastened to the inside of the bowl with a pair of rivets with heads on the outside. The conical-headed rivets are either copper or copper alloy. On the left side, only roughly 5 mm wide holes survive of the two rivets.

The browguard was cast and fastened to the bowl with three copper or copper alloy rivets: two with clearly visible heads on the exterior at both ends of the browguard and one on the front, which is only discernible on the interior of the helmet.

The neckguard is made integrally with the bowl. It has a hole in the middle that holds a copper or copper alloy rivet with a hemispherical head on the upper side. It passes through the neckguard and a round copper or copper alloy washer on the underside. The upper side bears a punched inscription C.MATI. CHO.III. >.P.MVSSI.TAVRI.; there is a poorly discernible punched wreath between the first name and the cohort (*Pl. 6; Fig. 14e*).

[40] Hoffiler 1937, 31, 32, Fig. 4a,b. The helmet formed part of the private collection of Milan Praunsperger and came to the Hrvatski povijesni muzej after World War II. I was unable to verify the data on the findspot as reported by Hoffiller (l. c.).

8–10. **Crest-knobs of Buggenum and Haguenau helmets from the Ljubljana – Šumi site**
(*Fig. 15:* 8–10; site: *Fig. 18:* 8–10; *Pl. 7:* 8–10)

The Late Augustan–Tiberian layers at the Ljubljana – Šumi site (left bank of the Ljubljanica) yielded three upper parts of bronze helmets.[41] All the crest-knobs on these pieces have thin walls and were made integrally with the bowl, of bronze with approx. 12% of tin.

– **No. 8** (Buggenum):

Spherical crest-knob, with a roughly 3 mm wide and 1 mm deep hole, and upper part of the bowl (*Fig. 15:* 8; *Pl. 7:* 8) (wgt. 35.19 g; surv. h. 41 mm; bowl th. approx. 1 mm).[42] Kept in the Mestni muzej Ljubljana (Inv. No. 510:LJU;0056907).

– **No. 9** (Haguenau):

Conical crest-knob and small part of the bowl (*Fig. 15:* 9; *Pl. 7:* 9) (wgt. 16.70 g; surv. h. 32 mm; neck wall th. approx. 1.3 mm; bowl th. approx. 1 mm), bronze with around 13% tin.[43] Kept in the Mestni muzej Ljubljana (Inv. No. 510:LJU;0056908).

– **No. 10** (Haguenau):

Truncated conical crest-knob and upper part of the bowl (*Fig. 15:* 10; *Pl. 7:* 10) (wgt. 19.45 g; surv. fragment h. 42 mm; neck and bowl th. approx. 1 mm), bronze with around 13% tin.[44] Kept in the Mestni muzej Ljubljana (Inv. No. 510:LJU;0056909).

[41] Gaspari 2010, 90, 94, Pl. 28: Š 1181,Š 899,Š 1307. The publication states that they originate from 'Early Roman deposits'. The dating to the Late Augustan–Tiberian period is based on the wider context of the site.

[42] Elemental composition: Fe 0.26%, Cu 86.9%, As -, Se -, Br -, Ag -, Sn 12.7%, Au -, Pb 0.13; patina on the exterior: Fe 4.12%, Cu 58.4%, As 0.10%, Se -, Br -, Ag -, Sn 37.1%, Au -, Pb 0.23%; patina on the interior; Fe 3.06%, Cu 60.2%, As 0.09%, Se -, Br -, Ag -, Sn 36.10%, Au -, Pb 0.22%.

[43] Elemental composition: Fe 0.22%, Cu 87.5%, As 0.11%, Se -, Br -, Ag -, Sn 12.2%, Au -, Pb -; patina on the exterior – Fe 1.31%, Cu 49.2%, As 0.46%, Se -, Br -, Ag -, Sn 48.9%, Au -, Pb 0.18%; patina on the interior – Fe 2.03%, Cu 58.5%, As 0.52%, Se -, Br -, Ag -, Sn 36.60%, Au -, Pb -, Cr 2.34%.

[44] Elemental composition: Fe 0.22%, Cu 87.0%, As 0.02%, Se -, Br -, Ag -, Sn 12.7%, Au -, Pb 0.04%; patina on the exterior – Fe 1.00%, Cu 73.6%, As 0.05%, Se 0.059%, Br -, Ag -, Sn 25,1%, Au -, Pb 0.21%; patina on the interior – Fe 2.65%, Cu 62.2%, Zn 0.34%, As 0.05%, Se 0.08%, Br -, Ag -, Sn 34.30%, Au -, Pb 0.30%. The high tin content measured in the patina on the exterior and interior are probably the consequence of corrosion processes (Meeks 1993; Šmit et al. 2005, 218–219.

Fig. 15: Ljubljana – Šumi (crest-knobs Cat. Nos. **8**–**10**). Ljubljana – Tribuna (cheek-piece Cat. No. **12**: **a** – exterior; **b** – interior. Strmca near Povirje (crest-knob Cat. No. **13**).
Sl. 15: Ljubljana – Šumi (gumbi kat. št. **8**–**10**). Ljubljana – Tribuna (lični ščitnik kat. št. **12**: **a** – zunanja stran; **b** – notranja stran. Strmca pri Povirju (gumb kat. št. **13**).
(Photo / Foto T. Lauko, NMS)

11–12. Crest-knob of a Haguenau helmet and a cheek-piece from the Ljubljana – Tribuna site
(*Figs. 15:* 12; *16;* site: *Fig. 18:* 11,12; *Pl. 7:* 12)

The remains of two successive forts have been investigated at this site (right bank of the Ljubljanica) dating to the Middle and Late Augustan, possibly also the Early Tiberian periods. The finds associated with the early fort (after 10 BC–beginning of the Late Augustan period) include a crest-knob, while a cheek-piece is among the finds associated with the later fort (from around AD 5 to the end of the Late Augustan or beginning of the Tiberian period).[45]

– **No. 11:**

As discernible from the published photo, the crest-knob (*Fig. 16*) of a copper alloy was separately cast and soldered to the top of the bowl.[46]

– **No. 12:**

A right cheek-piece (*Fig. 15:* 12; h. 163 mm; sheet metal th. at rim approx. 0.5 mm; wgt. 137.45 g) is forged of sheet bronze with roughly 8.5% tin. The exterior, which was perhaps tinned, bears a fine dark green patina with a very smooth surface, while the inside has a similar patina, as well as a

[45] Hvalec et al. 2009, 4; Gaspari et al. 2014, 138–143; Gaspari 2014, 131–133, Fig. 139. Both items in temporary storage at the ARHEJ d.o.o.

[46] The item was not available in August 2017 and could thus not be drawn, examined in detail, determined as to soldering traces on the underside and the elemental composition.

Fig. 16: Ljubljana – Tribuna. Crest-knob (Cat. No. **11**).
Sl. 16: Ljubljana – Tribuna. Gumb (kat. št. **11**).
(After / po: Gaspari 2014, Fig. / sl. 139)

patina with a slightly rough surface.[47] The front edge (incompletely preserved; *Fig. 15:* 12a; *Pl. 7:* 12a) has two semi-circular cusps with a roughly 12 mm wide raised border or flange. Other edges are sunken to form a roughly 7 mm wide and 3 to 5 mm high step. The upper edge has two hasps, 30 and 36 mm wide, respectively. The front loop, above the semi-circular cusps, is complete (l.30 mm; diam. approx. 7 mm), while the back loop (l. 36 mm), with the sheet metal rolled towards the inside, is only partially preserved. The axis bar is missing.

The lower outside part of the piece holds the remains of the head of a copper[48] rivet (its centre located 17 mm from the lower edge), of which a large part of the copper[49] shank survives on the inside (l. 8 mm; *Fig. 15:* 12b; *Pl. 7:* 12b). The rivet probably fastened a loop of sheet bronze[50] to the inside of the cheek-piece, of which the lower (surv. l. 22 mm; max. w. 12 mm) and upper strips (surv. w. and l.8 mm) survive, but the spot where the loop bent does not. The loop probably held the ring that in turn held the (leather) strap; i.e. was a tie-loop. The straps of the left and right cheek-pieces were tied under the chin.[51]

The presence of other rivets is indicated by rivet holes, all of which were punched from the outside: two large holes in the upper corners (diam. 3.5 and 5 mm), nine small ones (diam. 2–3 mm) along the edges and one roughly in the centre. There is no evidence to suggest that any of the holes fastened decorative pieces,[52] which leads me to conclude that the holes served to fasten a (leather) lining to the inside of the cheek-piece.

13. Crest-knob of a Haguenau helmet from Strmca near Povirje

(*Fig. 15:* 13; site: *Fig. 18:* 13; *Pl. 7:* 13)

The solid crest-knob (h. 37 mm; wgt. 68.61 g), made of leaded bronze[53] (*Fig.15:* 13), was found (by an unauthorised individual with a metal detector) on the interior slope of the west rampart at Strmca, which is the central peak of a prehistoric hillfort extending over three peaks southeast of Povirje.[54]

[47] Elemental composition: Fe 0.11%, Ni 0.18%, Cu 91.1%, Zn -, As 0.08%, Ag -, Sn 8.54%, Sb -, Pb -, Mn -; green patina at the front – Fe 3.53%, Ni 0.17%, Cu 52.9%, Zn 0.37%, As 0.20%, Ag -, Sn 42.6%, Sb -, Pb 0.23%, Mn -; grey patina at the back – Fe 1.94%, Ni -, Cu 84.8%, Zn -, As 0.10%, Ag -, Sn 13.0%, Sb -, Pb 0.10%, Mn -. The high tin content measured in the patina at the front may be the consequence of corrosion processes (Meeks 1993; Šmit et al. 2005, 218, 219) or indicates surface tinning.

[48] Elemental composition: Fe 0.53%, Ni -, Cu 99.3%, Zn -, As -, Ag -, Sn 18%, Sb -, Pb 0.04%, Mn -.

[49] Elemental composition: Fe 0.47%, Ni -, Cu 99.5%, Zn -, As -, Ag -, Sn -, Sb -, Pb -, Mn -.

[50] Elemental composition: lower strip – Fe 0.68, Ni -, Cu 83.7%, Zn -, As 0.29%, Ag -, Sn 15.3%, Sb -, Pb 0.07%, Mn -; upper strip – Fe 0.53, Ni -, Cu 87.7%, Zn -, As 0.22%, Ag -, Sn 11.4%, Sb -, Pb 0.11%, Mn -. The difference in the tin content was probably caused by the remains of patina on the measured spot on the lower sheet.

[51] Cf. Degen 1978, 171–175; von Detten, Schalles, Schreiter 1993, 185–187, Mil 7–9, Pls. 24, 25; Junkelmann, Thüry 2000, AG 331,-164,-165, Fig. 90.

[52] Cf. brass cheek-pieces with iron rivets on Weisenau helmets: Junkelmann, Thüry 2000, 165, 166, Cat. Nos. AG 546 and AG 547, Fig. 97.

[53] Elemental composition: Fe 0.015%, Ni 0.11%, Cu 64.4%, Zn 0.38%, As 0.95%, Ag 0.24%, Sn 6.96%, Sb 0.66%, Pb 26.3%, Mn -.

[54] The name of the peak (Strmca) is taken from geographic maps, while the archaeological literature thus far knows it under the name Štirnca (e.g. Slapšak 1974; Osmuk 2000–2004, 156–157; Osmuk 1976, 70–72). Immediately west of it lies the hill of Tabor (Hill 525.3 m). Strmca and Tabor each have a prehistoric rampart and are connected with a pair of walls running across the saddle between them. East of Strmca is another peak with a rampart that leans onto the rampart of the hillfort at Strmca (topographic description: Slapšak 1974). The pair of walls across the saddle are not discernible in the online lidar image.

Apart from the crest-knob, the amateur treasure hunter found the following items at Strmca: hobnail of Roman military footwear with a distinct pattern on the underside (Narodni muzej Slovenije, Inv. No. R 27127) suggesting a date from Caesar's Gallic War to around 20 BC (cf. Istenič 2015a, 57, 58), a Late Roman belt buckle with a mount (Narodni muzej Slovenije, Acc. No. 2013/4-3), as well as two Augustan coins and 17 coins from the 3rd and 4th centuries, three of those of Gordian (determined by the finder).

In literature, the name Tabor was used as a common name for all three peaks south of Povirje (Petru 1975; Osmuk 1974, 68–69; Osmuk 1976, 70–72). For this reason,

The remains of soldering[55] on the underside of the knob clearly show that the knob was soldered to the top of a bowl using a tin-lead alloy. The knob is kept in the Narodni muzej Slovenije (Inv. No. R 27126).

TYPO-CHRONOLOGICAL ATTRIBUTION OF HELMETS

The helmets from the Ljubljanica (*Fig. 1; 2; Pl. 1*), Kovačevše (*Fig. 3; Pl. 2*), the area of Sv. Anton (*Fig. 4; Pl. 3*) and Grad near Krn (*Figs. 5–9*) are Etrusco-Italic.

The helmets from the Ljubljanica (*Fig. 1; 2; Pl. 1*) and Kovačevše (*Fig. 3; Pl. 2*) belong to the typologically early examples of the Etrusco-Italic helmets. Pernet dates these (without providing solid evidence, as there are no helmets from reliably dated contexts) to the 4th and 3rd centuries BC.[56] According to Quesada Sanz and Kavanagh de Prado, similar helmets in the Iberian Peninsula came to light at sites dated to the late 3rd and early 2nd centuries BC, but they too offered no arguments to support the dating.[57]

The latest context with an Etrusco-Italic helmet is the shipwreck (mentioned in the Introduction) from Madrague de Giens (France) dated to around 70 BC.[58]

Junkelmann names the Etrusco-Italic helmets Type Montefortino and divides them into five subtypes.[59] The helmets from the Ljubljanica and Kovačevše fall into his Montefortino/Cremona subtype,[60] which is named after a helmet with a Latin inscription from Pizzighettone near Cremona that probably dates – based on the inscription – to the second half of the 3rd century BC.[61] One of the helmets of this subtype has a bronze fitting with two loops, that hold a bronze ring each, fastened to the underside of the neckguard with a copper alloy rivet;[62] such a fitting also survived on a helmet of the Montefortino/Canosa subtype.[63] Junkelmann believes that two straps were inserted into the rings that ran through the loops in the lower part of the cheek-pieces and then under the chin, where they were tied together.[64] Later helmets of the Etrusco-Italic tradition (Haguenau type) have a fitting with a suspension ring attached at this spot on the neckguard underside.[65]

The above indicates that we should consider a broad span, from the 3rd to the first third of the 1st century BC, for dating the helmets from the Ljubljanica and Kovačevše.

The punched wave pattern on the neckguards of the helmets originating in the area of Sv. Anton[66] (*Fig. 4*) and at Grad near Krn (*Figs. 5–8*) ranks them among the later Etrusco-Italic helmets dating to the 2nd and early 1st centuries BC. Such helmets were most numerously unearthed in Italy, southern France and Spain, while the findspots span from Spain to Greece and southern Russia, and include the burials of non-Romans. The helmets, primarily worn by the Late Republican Roman soldiers, thus found their way to the warriors of other peoples,[67] where they served to underline the high social standing of their owners.[68]

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and because of limited context data, we do not know as to which of the three interconnected hillforts yielded the finds marked as 'Tabor pri Povirju' (kept in the Narodni muzej Slovenije, Inv. Nos. P 19542–P 19551, P 27237, R 18608–R 18610, R 26244–R 26246, R 26394–R 26395). The objects date to the Late Hallstatt (one of them is a fragment of a Negova/Negau helmet), Early Roman (hobnail, cylindrical bell with a hexagonal handle) and Late Roman periods; the same is true of the two asses of Tiberius and Claudius, respectively (*FMRSl* I 51-2; *FMRSl* VI 35-1), and of the Late Roman coins (*FMRSl* VI 35-4,5,6).

Tabor also yielded four hobnails of Roman military footwear with a characteristic pattern on the underside (Narodni muzej Slovenije, Acc. No. 2018/17_1) that date between the period of Caesar's Gallic Wars and 20 BC (cf. Istenič 2015a, 57, 58).

[55] Elemental composition of the soldering remains, measured on the patina: Fe 3.43%, Ni 0.17%, Cu 43.1%, Zn 0.63%, As 1.78%, Ag 0.64%, Sn 17.7%, Sb 1.10%, Pb 31.4%, Mn -; measured on a patina-free spot: Fe 0.12%, Ni 0.13%, Cu 72.4%, Zn 0.45%, As 0.66%, Ag 0.19%, Sn 5.05%, Sb 0.44%, Pb 20.6%, Mn -.

[56] Pernet 2010, 73, 74, Fig. 37.

[57] Quesada Sanz, Kavanagh de Prado 2006, 70–72, Fig. 2.

[58] Feugère 1994a, 39, 40.

[59] Subtypes: Talamone, Canosa, Cremona, Rieti and Buggenum; he thus included the Buggenum helmets into the group of Etrusco-Italic helmets (Junkelmann 2000, 52–65).

[60] Junkelmann 2000, 59, 60; Junkelmann, Thüry 2000, 100, 107–110; Pl. 4; Figs. 30–34; Cat. Nos. AG 130; AG 290.

[61] Junkelmann 2000, 60, Figs. 10, 11.

[62] Junkelmann, Thüry 2000, 100, 109, 110; Pl. 4; Figs. 33, 34; Cat. No. AG 290.

[63] Junkelmann, Thüry 2000, 93, 94; Fig. 26; Cat. No. AG 441.

[64] Junkelmann 2000, 59; Junkelmann, Thüry 2000, 94, 96, 110.

[65] Cf. helmets from the Ljubljanica (No. 5), Mušja jama (No. 6) and the Sava at Mokrice (No. 7), and Fn. 126.

[66] Reinecke 1942, 190, Fn. 132; Egg et al. 1988, Cat. No. 109.

[67] Schaaff 1988, 319–322, Fig. 3; Egg et al. 1988, Cat. No. 111; Pernet 2010, 74, Fig. 38.

[68] Feugère 1994a, 39, 40.

Junkelmann ranked the helmets with the wave pattern and other similar helmets with different decorative designs to the Montefortino/Rieti subtype and, similarly as Schaaff, dated them to the 2nd and early 1st centuries BC.[69]

Closely resembling the example from Grad near Krn is the helmet from the area of Rieti (Italy), with excellently preserved decoration and the stamp Q. Cossius.[70] The two helmets share (as much as can be inferred from the published photos) the punched decoration of symmetrically positioned waves (composed of punched lines and dots) that are similar in production technique, design and location on the neckguard (*Fig. 17*), as well as the punched herringbone pattern above the rim of the bowl.

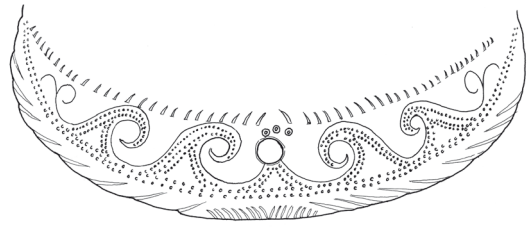

Fig. 17: Forum Novum near Rieti (Italy). Punched decoration on the helmet neckguard. Not to scale.
Sl. 17: Forum Novum pri Rietiju (Italija). Punciran okras na vratnem ščitniku čelade. Ni v merilu.
(After / Po: Schaaff 1988, 321, Fig. / sl. 5)

The distribution of the late Etrusco-Italic helmets indicates a close connection between these helmets and the Roman army or the armies of their Italic allies,[71] while the Roman production can be inferred from the stamp on the helmet from Rieti. The earliest helmet positively identified as Roman is the above-mentioned example from the Cremona area bearing a Latin inscription, on which the form of the letters and the name suggest a dating to the second half of the 3rd century BC.[72] The Roman army still used such helmets in the early 1st century BC.[73]

Other Roman bronze helmets from Slovenia, which trace their origins in the Republican helmets of the Etrusco-Italic tradition, are later and date to the Principate.

The helmet from the Ljubljanica (*Figs. 10–12; Pl. 4*) is of a transitional form between the Buggenum and Haguenau types.[74] The absence of a browguard and the integral hollow knob tie it to the typologically earlier Buggenum helmets,[75] while the features that point to the later helmet type, named after the Haguenau site in Alsace (France; Hagenau in German) and characterised among other things by a separately made crest-knob, are the plume tubes at the sides and the back of the bowl.[76] Another such feature is the punched inscription on the neckguard that relates the owner of the helmet and the unit in which he served, as by far the greatest number of inscribed helmets belongs to the Haguenau,[77] and only rare examples to the Buggenum type.[78]

Similar helmets that are typologically between the Buggenum and Haguenau types have been found at Neuss[79] and at an unknown site.[80] Similarly as the helmet from the Ljubljanica, they are made integrally with the crest-knob and are without the browguard, but correspond with the Haguenau type in every other feature. The helmet from an unknown site has a punched inscription on the underside.

The hole in the neckguard (*Fig. 11e,f*) indicates the spot where the fitting with a presumable suspension ring was riveted to the underside of the neckguard.[81]

The Buggenum helmets probably developed in the mid-1st century BC[82] and their concentration

[69] Junkelmann 2000, 53, 60–62; Junkelmann, Thüry 2000, 110–115; Figs. 35–41; Cat. Nos. AG 597, AG 266, AG 310.

[70] Junkelmann 2000, 61, Fig. 13; Schaaff 1988, 321, Fig. 5.

[71] Schaaff 1988, Fig. 3; Pernet 2010, 74, Fig. 38.

[72] Junkelmann 2000, 60; Figs. 10, 11.

[73] Feugère 1994a, 39, 40; Pernet 2010, 75.

[74] Schaaff 1988; Waurick 1988; Waurick 1990, 12, 13, 20–30, Fig. 22, Figs. 7, 12, 13, 16–19, 22, Pl. 1: 2; Ortisi 2015, 27, 28.

[75] Cf. Schaaff 1988, 325, 326.

[76] Ortisi 2015, 27; Waurick 1988, 327–333; Haguenau helmets with (partially) surviving plume tubes: von Detten, Schalles, Schreiter 1993, 178–181, Mil 1, 2, Pls. 20, 21; Klein 2003, 30–32, Figs. 3–5.

[77] Waurick 1988, 332, 333.

[78] Schaaff 1988, 325, 326.

[79] Waurick 1988, 328, 329; Fig. 1: 1.

[80] Junkelmann, Thüry 2000, 123; Cat. No. AG 538.

[81] Cf. von Detten, Schalles, Schreiter 1993, 180–185, Mil 2–4, Pls. 21–23; Klein 2003, 31, Fig. 4.

[82] The main element in dating their beginning is the helmet from the River Kupa near Sisak with the inscription SCIP IMP (Egg et al. 1988, 529, Cat. No. 113; Waurick 1990, 12, 13, 20–23, Figs. 12, 13), which suggests that the helmet owner served under the command of P. Cornelius

along the lower reaches of the Rhine speaks of their use in the Middle (and Late) Augustan periods, when the area witnessed increased activities of the Roman army. Soon afterwards, they were replaced by the Haguenau type.[83]

The earliest Haguenau helmet from a narrowly dated context comes from Haltern and has all the features of the type including the browguard.[84] From the Augustan to the (Early) Flavian period when the Haguenau helmets fell into disuse, the neckguards grew in length and width.[85]

The shallow-angled and short neckguard on the helmet from the Ljubljanica (*Fig. 11b–f*) is only slightly wider than the bowl and similar to the neckguard on the helmet from Haltern.

The helmet from the Ljubljanica can most likely be attributed to the final period of use of the Buggenum type and the beginning of use of the Haguenau type, i.e. to the Middle or Late Augustan period.

The inscription *P(ublii) Oppi(i) >(centuria) Cracci* on the helmet (*Fig. 12; Pl. 4*) reveals that it belonged to a soldier named Publius Oppius, who served in a century commanded by a man with the cognomen Graccus or, less likely, Craccus.[86] The owner of the helmet is presented with its praenomen and nomen/gentilicium, which clearly shows him to be a Roman citizen, but also that the helmet can be dated prior to the end of the first half of the 1st century.[87] *Oppius* is a Latin name[88] most numerously represented in Italy,[89] which suggests that the owner came from Italy.

The identification of the helmet from Mušja jama near Škocjan (*Figs. 13; Pl. 5*) as the Haguenau type is determined by the two holes in the front side of the helmet, which show where the browguard would have been attached, but also by the form of the crest-knob with a vertical slot in the centre.[90] Thetypological characteristics (form and angle of the neckguard) and the integral crest-knob suggest an early date,[91] while the comparison with the helmet from Haltern shows a date after the Augustan period. The two holes on the neckguard are unusual and have not yet been explained as to their function.

The inscriptions *>(centuria) Caesidieni C(aius) Tomius* and *>(centuria) Postumi M(arci) Valeri Bacini*[92] (translation: of Caesidienus' century, (owner) Gaius Tomius[93] / of Postumus' century, (helmet of) Marcus Valerius Bacinus) on the neckguard (*Fig. 13; Pl. 5*) name the presumably successive owners of the helmet.[94] One was Marcus Valerius Bacinus from the century commanded by Postumus, the other was Gaius Tomius and served in the century commanded by Caesidienus. Both helmet owners were Roman citizens. Tomius, Caesidienus and Postumus are all Latin names.[95] Caesidienus only appears in this inscription, Tomius is rare,[96] while Postumus is a common name, most frequently recorded in Italy.[97] Except for the helmet from Mušja jama, the name Bacinus is only known on one other inscription from Hispania.[98] We may presume that one owner, Gaius Tomius, and both commanders came from Italy.

The helmet reportedly found in the River Sava at Mokrice (*Fig.14; Pl. 6*) also belongs to the Haguenau type. The neckguard is relatively long and widened at the sides, which together with the absence of the crest-knob indicates a late example of the type and a dating to the second quarter of the 1st century AD.[99] The inscription *C(aii) Mati(i)*

Scipio Nasica who was given the title of *imperator* in 49 BC and died in 46 BC.

[83] Schaaff 1988, 325, 326; Feugère 1994a, 47–49, 79, 80; Schreiter 1993, 44; Ortisi 2015, 27.

[84] Müller 2002, 34, 35, 181, No. 430; Pls. 39, 40.

[85] Waurick 1988, 329, 356; Feugère 1994a, 84, 85; von Detten, Schalles, Schreiter 1993, 180.

[86] It seems even less likely that the inscription relates the gentilicium of the commander of the century, i.e. Craccius or Graccius.

[87] Bodel 2001, 83, 84.

[88] Solin, Salomies 1994, 132.

[89] *OPEL* III, 114; *EDCS* (the name appears in 268 inscriptions, almost half of which originate from Italy).

[90] Degrassi (1929) already determined it as the Haguenau type and dated it to the Early Imperial period. Vidulli Torlo (2008, Cat. No. 21) ascribed it to the Buggenum type, as did Maggi (Maggi 2005; 2016), who dated it to the end of the Republican period also on the basis of the inscriptions (in my opinion erroneously).

[91] Cf. Waurick 1988, 329, 332, 356, Fig. 2; von Detten, Schalles, Schreiter 1993, 178–185, Pls. 20–23; Feugère 1994a, 81–86; Junkelmann 2000, 67, 68.

[92] *CIL* I 3609 = *AE* 1930, 127 = *EDR*007414 = *EDCS*-26700425.

[93] The owner's name on Roman helmets only rarely occurs in the nominative (instead of the genitive case) (e.g. helmet from Schaan: Degen 1978, 172–174).

[94] Punched owner's inscriptions are common on Haguenau helmets (Waurick 1988, 332–333), which leads me to disagree with the hypothesis that one of the inscriptions on the helmet from Mušja jama is the name of a divinity (cf. Teržan 2016, 429, 430).

[95] Solin, Salomies 1994, 40, 143, 189.

[96] *EDCS* lists one inscription with this name (*EDCS*-33100117).

[97] *EDCS*: 278 inscriptions, half from Italy, *OPEL* III, 155.

[98] *OPEL* I, 107 (Baccinus).

[99] Cf. Fn. 85.

c(o)ho(rtis) III >(centuria) P(ublii) Mussi(i) Tavri (*Fig. 14e; Pl. 6*) relates that the helmet owner, Gaius Matius, was a Roman citizen and served in a legion, which corresponds with the mention of the third cohort.[100] The century of Gaius Matius was commanded by Publius Mussius Taurus.[101] Matius and Mussius are Latin names,[102] both most common in Italy,[103] which leads me to suggest that the helmet owner and his commanding officer both came from Italy. The fact that the owner is named with his praenomen and nomen/gentilicium without the cognomen indicates that the helmet does not postdate the late first half of the 1st century.[104]

The forms of the crest-knobs from Ljubljana – Šumi (*Fig. 15:* 8–10; *Pl. 7:* 8–10) have close parallels among the Buggenum and Hageunau helmets. They were made integrally with the bowl, which is characteristic of the Buggenum helmets, but can also be found on the early Haguenau helmets, with the latter type otherwise predominantly displaying separately made knobs subsequently fastened to the bowl.[105]

The (truncated) conical form of two of the crest-knobs suggests they more likely belonged to Haguenau helmets (*Fig. 15:* 9,10; *Pl. 7:* 9,10),[106] while the spherical form of one knob speaks in favour of a Buggenum helmet (*Fig. 15:* 8; *Pl. 7:* 8).[107] The conical crest-knobs from Ljubljana – Tribuna (*Fig. 16*) and Strmca near Povirje (*Fig. 15:* 13; *Pl. 7:* 13), which were separately made and soldered to the bowl, also belong to respective Haguenau helmets. The crest-knob from Ljubljana – Tribuna comes from a narrowly-dated context (earlier camp, dating: after 10 BC–beginning of the Late Augustan period),[108] showing that already the earliest Haguenau helmets could have soldered crest-knobs.

The attribution of the cheek-piece (*Fig. 15:* 12; *Pl. 7:* 12) from the later fort (dating: from around AD 5 to the late Augustan or early Tiberian period) at Ljubljana – Tribuna is unclear. It has a close parallel in a tinned copper alloy cheek-piece from Gamla (Israel) that probably formed part of the helmet of a legionary and dates to AD 67; it has a similarly shaped edge lined with holes, of which the left hole at the top holds a large rivet head. In the publication, the cheek-piece is associated with a Haguenau helmet.[109]

Only two Haguenau helmets survive complete with cheek-pieces, both from Schaan (Liechtenstein).[110] These cheek-pieces are of the same basic form as the example from Ljubljana (without ear cusps), but simpler and flat, i.e. without raised and sunken edges.

Similar edge moulding as the cheek-piece from Ljubljana can be seen on the cheek-pieces of the Weisenau helmets, but these are rarely copper alloy (usually iron) and usually have an ear cusp; the exceptions in this respect are the cheek-pieces without an ear cusp of an early variant of Weisenau helmets (the Weisenau/Nijmegen subtype after Junkelmann) that are of copper alloy and tinned.[111] The cheek-pieces from Schaan have a rivet with a large head on the outside that most probably served to fasten the (leather) strap connecting the left and right cheek-pieces.[112] Probably serving the same function was the (partly surviving) loop on the inside of the cheek-piece from Ljubljana, which has close parallels (the rings in the loops survived) on the three copper alloy cheek-pieces, presumably of Haguenau helmets, from the River Rhine at Xanten, and also with the partly surviving loops on the cheek-pieces of the presumably Weisenau helmets from the same site.[113] We may suppose that the cheek-piece from Ljubljana formed part either of a Haguenau helmet or of an early variant of a Weisenau helmet.

[100] Cf. Waurick 1988, 332.

[101] Hoffiler 1937, 31, 32. The century of (P. Mussius) Taurus is mentioned on two other helmets: one from the River Sava at Zagreb and the other from Moesia Inferior (Mac Mullen 1960, 33, Nos. 6–8; erroneously associated with the 3rd cavalry cohort – cf. Waurick 1988, 332).

[102] Solin, Salomies 1994, 115, 124.

[103] Matius: the *EDCS* database lists 126 inscriptions (more than half from Italy); Mussius: 41 inscriptions (half from Italy).

[104] Bodel 2001, 83, 84.

[105] Cf. above in this chapter; Schaaff 1988, 325; Waurick 1988, 327.

[106] Waurick 1988, 327, 328, 331, 332; Figs. 1: 1,2,4; 1A; 1B; 2: 1,3.

[107] Schaaff 1988, 325.

[108] Cf. Fn. 45.

[109] Stiebel 2014, 58–62; Fig. 4.2: 1.

[110] Degen 1978, 171–176; Waurick 1988, Fig. 1: 3.

[111] Waurick 1988, 333–335, Fig. 3: 1; Junkelmann 2000, 78, Cat. No. AG 292; Junkelmann, Thüry 2000, 124, 125, 129, 164, 165, Cat. Nos. AG 292, AG 331. The two cheek-pieces on a helmet of a Weisenau/Guttman subtype also lack ear perforations (Junkelmann 2000, 79, 80; Junkelmann, Thüry 2000, 140, 141, Cat. No. AG 600).

[112] Degen 1978, 171–175.

[113] von Detten, Schalles, Schreiter 1993, 185–190; Pls. 24–27; Mil 7–12.

MATERIALS AND PRODUCTION TECHNIQUES

All the Etrusco-Italic helmets from Slovenia were made in a single piece with the crest-knob. Traces of the production technique reveal that the helmets were forged, polished on the outside and decorated using the punching technique.

The analyses have revealed an approximate elemental composition of the helmets from the Ljubljanica and from Grad near Krn. Both are made of bronze containing roughly 12% and 6% tin, respectively, while the lead content is too low for the material to be deliberately added. Such an alloy is suitable for casting and forging, the alloy with 12% of tin is also optimal in hardness and toughness.[114]

The results of the elemental analyses of the helmets from Slovenia correspond well with the results of eleven other Etrusco-Italic helmets (Montefortino/Talamone, Montefortino/Canosa and Montefortino/Cremona subtypes after Junkelmann).[115] This shows that the helmets were usually made of bronze with a medium amount of tin (6 to 11 or 12%) and no or very little lead and other elements. Such an alloy is suitable for casting, forging and other cold forming techniques.[116] Binary alloys of copper/tin with 5–7% to 10–12% tin content were used for Late Bronze Age helmets.[117]

Thus far, the most detailed interpretation of the production technique for the Etrusco-Italic helmets has been proposed by Born. He believed that they were made in one of two ways: casting the knob and the material later forged to obtain the bowl and casting the knob and the fully formed bowl. In both cases, the helmet was finished with forging or the outside polished on a slow wheel. As for the decoration, he proposed that the scale pattern on the crest-knobs was made either during the casting process or later by engraving, while the cable pattern on the rim was made by filing.[118]

The examination of the helmets from Slovenia revealed that there are no traces of the crest-knobs being cast and that hollow crest-knobs could easily have been made by forging.[119]

Bronze with around 10% and 12% tin was used to make the helmet of the Buggenum/Haguenau type from the Ljubljanica and three upper parts of either Buggenum or Haguenau helmets from the Ljubljana – Šumi site. Bronze with such tin content is hard and tough.[120] The crest-knobs of the helmets were made integrally with the bowl. It seems reasonable to assume that these helmets were made by forging and their exterior later polished on a wheel. I believe the same method was used to make the helmets from Mušja jama and the River Sava at Mokrice.

The crest-knob of the Haguenau helmet from Strmca near Povirje was separately cast of leaded bronze and soldered with a tin-lead alloy to the top of the bowl. A careful examination and identification of the alloys of other knobs of Haguenau helmets will show whether the separately made knobs were usually cast of leaded bronze. This would seem reasonable as the inclusion of lead in the alloy greatly improved the casting properties of bronze and also reduced its cost, making it suitable for products that did not require the mechanical properties such as hardness and toughness necessary for helmet bowls.

The cheek-piece from Ljubljana – Tribuna was forged of bronze with 8–9% tin, i.e. alloy suitable for cold working,[121] which is consistent with the established production technique.

The data on the alloys used to make the Haguenau helmets recovered in Slovenia are comparable with those on the helmet of the same type from Haltern, the crest-knob of which was made in a single piece with the bowl, while the browguard was made separately. Browguard is brass (92.16% copper and 7.63% zink), while the helmet proper is of leaded bronze with very high tin content (mayor alloying metals are copper – 64.71%, tin – 26.04% and lead – 7-87%).[122] Such an alloy is appropriate for casting, but not for cold working.[123]

The elemental composition of other Buggenum or Haguenau helmets and their parts is not known to me.

[114] Born 1991, 73, 77.

[115] Born 1991.

[116] Born 1991, 77 (lead content is less than 0.25%, only in one case 1.7%).

[117] Trampuž Orel 2016, 333.

[118] X-ray images in the first case only show traces of forging, in the second case both of casting and forging (Born 1991, 75–77, Pls. 12–14). Junkelmann (2000, 54, 55) also presumes polishing on a slow wheel.

[119] I sincerely thank Christoph Steidl Porenta (cf. Fn. 30) and Tomaž Lazar (Narodni muzej Slovenije) for their opinions on the subject.

[120] Brown 1976, 25.

[121] Brown 1976, 25.

[122] Riederer 2002, 121; Table 19.

[123] Cf. above and Brown 1976, 25, 26.

The publications of Buggenum helmets do not state the production technique, while the Haguenau helmets are generally believed to have been made by forging (rarely cast first and then forged).[124] This calls for an in-depth analysis of the production manner of the Buggenum and Haguenau helmets that will include the characterisation of the alloys.

Filling the interior of the knob (probably with a lead-tin alloy) as seen on the Buggenum/Haguenau helmet from the Ljubljanica, is mentioned in the publications of rare other Roman bronze helmets from the Republican period or the Principate.[125]

The hinges that fastened the cheek-pieces on the discussed helmets are made either of bronze (both helmets from the Ljubljanica and probably also the one from the Sava at Mokrice) or of iron (helmet from Grad near Krn) and were either forged (both helmets from the Ljubljanica and the helmet from Grad near Krn) or cast (helmet from the Sava at Mokrice). The hinges were fastened to the bowl with copper rivets (both helmets from the Ljubljanica), bronze(?) (helmet from Mušja jama), copper/copper alloy (helmet from the Sava at Mokrice) or iron (helmet from Grad near Krn).

The remains of a rivet in the middle of the neckguard only survive on the helmet from Mušja jama and show that it was of iron. Comparing it with the helmets from other sites reveals that these rivets were usually made of copper or copper alloy and fastened the hinge loop to the underside of the neckguard.[126]

The hinges for fastening cheek-pieces to the bowl of the helmets from other sites are usually made of a copper alloy and forged, but they – possibly the helmets latest in date – can also be cast.[127] Their publications do not state whether the rivets were made of copper or bronze. Iron rivets are rarely used in the Etrusco-Italic[128] and later Roman bronze helmets;[129] I noted no iron hinges (for attaching cheek-pieces) in literature. It would appear that copper rivets were standard in the Roman military equipment.[130] Copper was also used for the rivet on the cheek-piece from Ljubljana – Tribuna.

Because of its toughness and plasticity, copper is particularly suitable for connecting elements such as rivets, which had to withstand relatively great stresses. This is also true of wrought iron (or low-carbon steel), obtained from pig iron, which is very strong, ductile and of a low hardness so that it can withstand a high degree of plastic deformation.[131]

The earliest brass elements on the helmets from Slovenia are the plume tubes on the helmet from the Ljubljanica, which is a transitional form between the Buggenum and Haguenau types. They also occur on the latest type of the Roman helmets of the Etrusco-Italic tradition, i.e. the Haguenau type.[132] Romans began producing and using brass around 60 BC and it became common in military equipment from the Augustan period onwards.[133] Brass was also used to make decorative elements and crest-holders of the iron Weisenau helmets.[134]

Also associated with the latest of the helmets of the Etrusco-Italic tradition is soldering. Tin-lead alloy was used to solder the plume tubes (helmet No. 5 from the Ljubljanica) and crest-knobs, if the knobs were separately made (knob from Strmca near Povirje). The use of tin-lead alloy for soldering was common in the Roman military equipment.[135]

[124] Waurick 1988, 327, 328. Given the information in von Detten, Schalles, Schreiter 1993 (178–184, Mil 1–6), the six Haguenau helmets from the Rhine at Xanten that probably date to the first half/middle of the 1st century were only made by forging. Feugère (1994a, 84), to the contrary, believes that a combination of casting and cold working was employed.

[125] Junkelmann 2000, 55.

[126] Well-preserved hinge-loops can be found on the helmets from the Rhine at Xanten (von Detten, Schalles, Schreiter 1993, 180–184; Pl. 22: Mil 2–6).

[127] E.g. the typologically late Haguenau helmets from Xanten (Waurick 1988, 331; Fig. 1B, bottom right).

[128] E.g. on two Monterfortino/Canosa helmets (Junkelmann, Thüry 2000, 93, 96; Cat. Nos. AG 441, AG 542; Fig. 28; Pl. 1).

[129] An iron rivet is mentioned on the neckguard of a Haguenau helmet from Haltern (Müller 2002, 181, Cat. No. 430).

[130] Istenič 2016, 279–281.

[131] Pleiner 2006, 16–20.

[132] Also cf. von Detten, Schalles, Schreiter 1993, 178–181, Mil 1, 2, Pls. 20, 21; Klein 2003, 30–32, Figs. 3–5.

[133] Istenič 2005; Istenič, Šmit 2007; Istenič 2010; Istenič 2015b; Istenič 2016.

[134] E.g. Breščak 2015, Graves 1 and 41, Pls. 4–6, 14–16 (in my opinion, the piping published as being of bronze is actually made of brass. Junkelmann, Thüry 2000 (128–144; Cat. Nos. AG 503, AG 501, AG 502, AG 600, AG 800) mention brass decoration (without mentioning any natural scientific analyses) on the iron Weisenau helmets. Cf. the crest-holder from the Ljubljana – Tribuna site (*Fig. 19*).

[135] Istenič 2016, 279–281.

CONCLUSIONS

Sites in Slovenia (*Fig. 18*) have thus far yielded several examples of Roman bronze helmets from the Late Republican and Early Imperial periods, more precisely six complete helmets, numerous fragments of another helmet, three fragments (with the crest-knob) of the upper parts of three helmets, two separately made knobs (of two helmets) and one cheek-piece. Four of the helmets are Etrusco-Italic, a form that ceased to be used in the opening decades of the 1st century BC. They are made in a single piece together with the knob and polished on the outside. Other helmets and their parts belong to the Buggenum (upper part with the knob of one helmet) and Haguenau types (two helmets, two knobs, two upper part fragments with the knob), as well as to the transitional form between the Buggenum and Haguenau types (one helmet); all these date to the Early Principate. The cheek-piece from Ljubljana belonged either to a Haguenau or Weisenau helmet.

Most of the bronze helmets from Slovenia come from undated contexts with the exception of the cheek-piece and the upper part of a helmet from Ljubljana – Tribuna, as well as the three upper parts of helmets from Ljubljana – Šumi, the contexts of which suggest a dating to the Middle and Late Augustan periods, and the Late Augustan–Tiberian periods, respectively. Dating most of these helmets is therefore based on their typological features. Because of the lack of comparable helmets from reliably dated contexts, such dating is least reliable for the two typologically earliest examples, i.e. the helmet from the Ljubljanica (Cat. No. 1) and the helmet from Kovačevše, for which I suggest a broad dating from the 3rd to the first third of the 1st century BC. The helmets from the area of Sv. Anton and from Grad near Krn, which have the characteristic punched wave pattern on the neckguard, probably date to the 2nd or the first third of the 1st century BC.

The typological features of the helmet from the Ljubljanica (Cat. No. 5) indicate a date to the Middle/Late Augustan period. A slightly later date is more likely for the helmet from Mušja jama (Tiberian period) and for the helmet reportedly found in the River Sava at Mokrice (Tiberian–Claudian period). The knob of a helmet from Strmca near Povirje belonged to a Haguenau helmet, which suggests a dating between the (Late) Augustan period and the second third of the 1st century AD.[136]

Two of the four Etrusco-Italic helmets from Slovenia – from Kovačevše above the valley of the River Vipava and from Grad near Krn above the valley of the River Soča – were found together with other small finds.

At Kovačevše, other finds of weapons comprise two prehistoric spearheads or possibly two spikes[137] and part of a chainmail[138] that may be either Roman or Celtic.[139] The finds from Krn include two ritually deformed Late Hallstatt axes, upper parts of two LT D1 swords (one with parts of its scabbard), four Late La Tène axes and several spearheads.

The finds from both sites predominantly consist of items that are related to the material culture of the prehistoric inhabitants living in the area roughly between the 5th and the 1st century BC. The earliest among the few Roman items from Kovačevše are the brass Alesia[140] and Jezerine I[141] brooches dated roughly between 60 and 15 BC.[142] In addition to the helmet, the finds from Krn include two Roman products that are both bronze vessels: an Idrija type jug (second half/last third of the 2nd century–80/60 BC[143]) and a cylindrical vessel (1st century BC[144]), while the bronze bucket is earlier (4th–3rd century BC) and probably originates in the pre-Roman milieus of the eastern part of northern Italy.[145]

The Roman army would very likely have been present in the Vipava Valley after the foundation of the colony of Aquileia in 181 BC and occasionally immediately before that, as the valley lay en route to the eastern hinterland of Aquileia and to the crucial pass at Razdrto/*Ocra* that the Romans conquered in the 2nd century BC.[146] In spite of

[136] Cf. Fns. 84 and 85.

[137] Svoljšak 1983, 25, Nos. 143, 145–147; Pl. 4: 111–114.

[138] Svoljšak 1983, 20, No. 44; Pl. 3: 91.

[139] Cf. Beck, Chew 1991, 34, 35; Bishop, Coulston 2006, 63, 64.

[140] Svoljšak 1983, 14, 20, Nos. 1, 2, 4, 136, Pls. 1: 12,17,24,25; Istenič 2005, 206–209, Pls. 1: 3,9,15,16 (brooch No. 3 is made of copper-tin-zinc alloy).

[141] Svoljšak 1983, 19, No. 23, Pl. 1: 26; Istenič, Šmit 2007, 142, 144, 145, Fig. 3 (left brooch), Table 1: MNG Inv. No. 24.

[142] Istenič 2005, 189, 190; Istenič, Šmit 2007, 141, 142, 145.

[143] Boube 1991, 25–32; Bolla, Castoldi 2016, 134, 150, 151.

[144] Bolla, Boube, Guillaumet 1991, 7–11.

[145] Cf. Bolla, Castoldi 2016, 122–123; Turk et al. 2009c, 51, 54, 57–59.

[146] The hypothesis that the Romans assumed control of the pass is associated with the Roman destruction of the

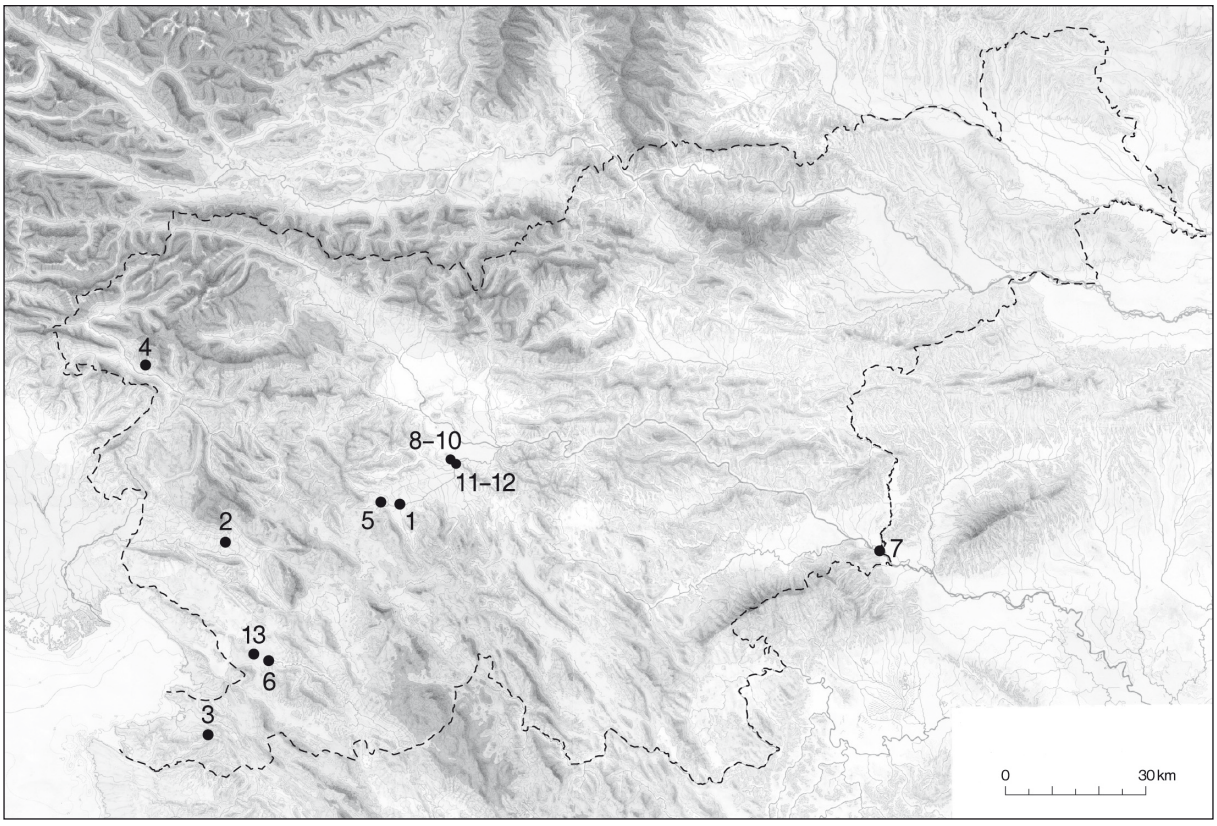

Fig. 18: Sites with Roman bronze helmets from the Republican period and the Early Principate in Slovenia.
Sl. 18: Najdišča bronastih rimskih čelad republikanske dobe in zgodnjega principata v Sloveniji.
(Source / Podlaga: Pregledna karta Slovenije, M. = 1:500.000, ©GURS 1968[2].)

1. River Ljubljanica at Blatna Brezovica (Tri Lesnice site) / reka Ljubljanica pri Blatni Brezovici (najdišče Tri lesnice). Subtype / podtip: Montefortino/Cremona.
2. Lokavec – Kovačevše (presumed findspot / domnevno najdišče). Subtype / podtip: Montefortino/Cremona.
3. Area of Sv. Anton / okolica Sv. Antona. Subtype / podtip: Montefortino/Rieti subtype.
4. Grad near Krn / Grad pri Krnu. Subtype / podtip: Montefortino/Rieti.
5. River Ljubljanica at Vrhnika / reka Ljubljanica pri Vrhniki. Type / tip: Buggenum/Haguenau.
6. Mušja jama near Škocjan / Mušja jama pri Škocjanu. Type / tip: Haguenau.
7. River Sava at Mokrice / reka Sava pri Mokricah (presumed findspot / domnevno najdišče). Type / tip: Haguenau.
8. Ljubljana – Šumi. Type / tip: Buggenum.
9–10. Ljubljana – Šumi. Type / tip: Haguenau.
11. Ljubljana – Tribuna. Type / tip: Haguenau.
12. Ljubljana – Tribuna. Type / tip: Haguenau/Weisenau.
13. Strmca near Povirje / Strmca pri Povirju. Type / tip: Haguenau.

this, the helmet from Kovačevše dated between the 3rd and the beginning of the 1st century BC, seems more probably to have been an early import (through trade or as a gift) of prestige within the prehistoric community rather than evidence of the actual presence of the Roman army.

A similar assumption can be made for the helmet from Krn, which is typologically later (2nd–first third of the 1st century BC). Occasional activities of the Roman army in the 2nd and 1st centuries BC in the upper valley of the Soča, which formed part of the wider hinterland of Aquileia and would

prehistoric settlement on the hill of Grad near Šmihel that had previously controlled the Razdrto pass, which is based on the numerous pieces of Roman weaponry recovered at the site (Horvat 2002, 142; Figs. 154, 155); they provide compelling evidence of the end of this settlement in the 2nd century BC, probably in the middle (Horvat 2015, 276, 267; Laharnar 2015, 11–14; Laharnar, Lozić 2016, 60–65). At the end of the 2nd or in the early 1st century BC, the Romans established a trading post at Razdrto (Horvat, Bavdek 2009, 93–96).

Fig. 19: Ljubljana – Tribuna. Brass crest-holder from a Weisenau helmet.
Sl. 19: Ljubljana – Tribuna. Medeninast nosilec perjanice čelade tipa Weisenau.
(Photo / Foto T. Lauko, NMS)

have been well known to Roman merchants,[147] are likely, but as yet unsupported by reliable and narrowly dated finds.[148] The Roman helmet, found at a site with the material culture associated with the local prehistoric population and with only individual objects (metalware) imported from Italy, may represent an item of trade, a gift or booty.

As for the Etrusco-Italic helmet from the Ljubljanica, the proposed dating from the 3rd to the early 2nd or 1st centuries BC is surprisingly early given the site. Apart from the helmet, the earliest recorded Roman objects from this river are a bronze Idrija type jug[149] (second half/last third of the 2nd century–80/60 BC[150]) and Roman bronze coins from the mid-2nd century BC,[151] while the earliest military finds are considerably later and date to the early second half of the 1st century BC.[152] In view of the known geo-political situation in the south-eastern Alps, Roman military activities in the Ljubljana Basin in the 3rd and early 2nd centuries BC seem less likely;[153] moreover, no (other) finds indicate their later activities before the middle of the 1st century BC. All this speaks in favour of interpreting the helmet as an object brought into a prehistoric community as an item of trade or as a gift.

The context of the helmet from the area of Sv. Anton is poorly known and the broad dating to the 2nd or early 1st century BC, a time when the Roman military presence is to be expected in the hinterland of Aquileia,[154] offer no clues as to whether the item was a Roman import to the prehistoric community or direct evidence of the Roman army.

To the contrary, the later Roman bronze helmets or their parts that span from the Middle/Late Augustan period to the end of the first half of the 1st century AD represent just such evidence for different sites. The four knobs and one cheek-piece of helmets from Ljubljana are connected with the activities of the Roman army here between 10 BC and the opening years AD (finds associated with the remains of the early fort on the right bank) and in the Late Augustan–Tiberian time (the military involved in the construction of the fortified town on the left bank of the Ljubljanica); they can be seen as direct evidence of the Roman military presence because of the archaeological contexts[155] and the fact that the items correspond well with other army-related finds from Ljubljana spanning from the Middle Augustan to the Tiberian periods that clearly show the importance of the Ljubljana area in the Roman military conquests of Pannonia in the Middle Augustan period, during the Pannonian-Dalmatian rebellion in AD 6–9 and in the construction of the fortified town of Emona on the left bank of the Ljubljanica.[156]

[147] Roman items appear in the sanctuary at Gradič above Kobarid from the 2nd century BC onwards (Osmuk 1984, 232; Osmuk 1997; Osmuk 1998), while a hoard of Roman and Celtic coins from the second half of the 2nd century BC was found in the vicinity (Kos, Žbona Trkman 2009). Laharnar, Štular and Mlinar (2015) suppose that in the 2nd century the Romans built a fortified settlement at Gradič, which also functioned as a trading post.

[148] For Kobarid and its area see Laharnar, Štular, Mlinar 2015, 252–253.

[149] Istenič 2009g.

[150] See Fn. 143.

[151] Miškec 2009.

[152] Istenič 2000a; Istenič 2000b; Istenič 2008.

[153] The earliest Roman settlement at Vrhnika/*Nauportus* at the springs of the Ljubljanica dates from the end of the 2nd to the first half of the 1st century BC (P. Vojakovič and I. Bekljanov Zidanšek, the article in preparation). Overview of the Roman conquests of the south-eastern Alpine region: Horvat 2015 (with references).

[154] Horvat 2015.

[155] Gaspari 2010, 88–99; Gaspari 2014, 131–133, Fig. 139.

[156] Gaspari 2010, 88–99, 141–142; Vičič 2002; Gaspari 2014, 127–141; Gaspari et al. 2015.

The helmet knob from Strmca near Povirje might suggest the presence of Roman soldiers in the period from the Middle Augustan to the Flavian period. The hobnail from Strmca and four hobnails from the nearby Tabor indicate a (occasional) presence of Roman soldiers roughly between 60 and 20 BC.[157] Both sites are on elevations (542 and 525.3 m asl) that enabled the control of communications leading towards Trieste, northern Istria, the Kvarner Bay and the Razdrto Pass.

The helmets from the Ljubljanica, Mušja jama and the Sava are undeniably associated with Roman soldiers through the owner's inscriptions. These also show the soldiers to be Roman citizens, i.e. legionaries, the origin of whom should mainly be sought in Italy. This speaks in favour of the already expressed view that the bronze helmets in the tradition of the Etrusco-Italic helmets (Buggenum and Haguenau types) were worn by soldiers who were Roman citizens, mainly Italian in origin and serving as legionaries.[158]

The Buggenum/Haguenau helmet from the Ljubljanica, alongside other objects, reflects the intensive Roman military transport activities in the Middle and Late Augustan periods along the Ljubljanica and further on along the main route (on land and along the Sava) towards the northern Balkans.[159] The strong military presence of the Romans on this route in the area of the Brežice Gate (between Krško and Bregana), which is evidenced for the period between the late 1st century BC and early 1st century AD by the remains of army camps,[160] cannot be connected with the helmet reportedly found in the Sava at Mokrice; its typological features rather suggest a dating to the Tiberian–Claudian period.

Other Roman helmets from the Augustan period and the 1st century AD in Slovenia belong to the Weisenau type. These helmets were developed under the influence of the Celtic tradition and remained in use in the 2nd century. They were most frequently made of iron and decorated with fittings of copper alloy (brass), but they could also have been made of copper alloys.[161] The characteristic crest-holders of such helmets (made of iron or copper alloy) were found at Kranj (iron)[162] and Ljubljana (Tribuna;[163] *Fig. 19;* h. 64 mm; wgt. 11.92 g; of pure brass[164]), a cheek-piece of copper alloy at Panorama in Ptuj,[165] while presumed fragments of copper alloy piping[166] came to light among the finds from a Late Augustan work or repair shop of military gear in Ljubljana,[167] but also at the Ljubljana – Šumi site[168] and at Kranj.[169]

Complete Weisenau helmets in Slovenia came from graves of the soldiers of auxiliary units.[170] This supports the hypothesis, proposed also on the basis of the grave finds from Slovenia, that these helmets were generally worn by Roman soldiers serving in auxiliary units.[171] In the last third of the 1st century, legionaries began wearing the Weisenau helmets while abandoning those of the Haguenau type.[172]

[157] Cf. Fn. 53.

[158] Waurick 1988, 354–356; Schreiter 1993, 44.

[159] Istenič 2009c; Istenič 2009e.

[160] Obrežje and other sites of more or less reliably identified remains of army installations (Mason 2006; Mason 2008; Guštin 2015).

[161] Waurick 1988, 333–335; of importance for dating the beginnings of this type is the Middle-Late Augustan burial from Verdun (Breščak 2015, 79, 80, Gr. 1; Pls. 1–6).

[162] Sagadin 2015, Pl. 1: 4.

[163] Gaspari 2014, 138–141, Fig. 139. For the findspot see the description of Cat. Nos. 11 and 12. The crest-holder (ARHEJ d.o.o., temporary No. P.N. 2052) is made of copper alloy. It was not found *in situ* (but rather on top of a spoil heap) and can therefore not be directly linked to the remains of one of the two investigated camps. I sincerely thank Iris Bekljanov Zidanšek (ARHEJ d.o.o.) for the information.

[164] Elemental composition: Fe 0.31%, Ni -, Cu 83.1%, Zn 16.3%, As -, Ag -, Sn 0.21%, Sb -, Pb 0.11%, Mn -.

[165] Horvat 2017. Cf. Junkelmann, Thurry 2000, 127, 128, 131, 164, 165; Figs. 61, 62, 91; Pl. 11, Cat. Nos. AG 502, AG 410.

[166] The piping fragments are not easily distinguishable (in drawings) from scabbard guttering of the Mainz swords.

[167] Vičič 2002, 204, 205, Pl. 12: 55–60; date: Horvat 2012, 280, 281.

[168] Gaspari 2010, 90.

[169] Sagadin 2015, 215, Pl. 1: 2.

[170] Idrija pri Bači, Gr. 16 (Guštin 1991, Pl. 16: 1); Verdun, Graves 1 and 41 (Breščak 2015, Pls. 4–6, 14, 15); interpretation of burials with Roman weapons: Istenič 2013. The Narodni muzej Slovenije keeps another such helmet of unknown provenance that may have been found in Slovenia.

[171] Waurick 1988, 353–356; such helmets may have been worn by legionaries even before the Flavian period (Junkelmann 2000, 74–82).

[172] Waurick 1988, 356; von Detten, Schalles, Schreiter 1993, 180; Schreiter 1993, 47.

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Abbreviations / Kratice

CIL = Corpus inscriptionum Latinarum.

EDCS = Epigraphik-Datenbank Clauss / Slaby (Service provider / skrbnik: Manfred Clauss) [http://db.edcs.eu/epigr/epi_de.php].

EDR = Epigraphic Database Roma (Service provider / skrbnik: DigiLab Centro interdipartimentale di ricerca e servizi, Sapienza Università di Roma) [http://www.edr-edr.it].

FMRSl I–II: P. Kos, *Die Fundmünzen der römischen Zeit in Slowenien* I, II (Berlin 1988).

FMRSl VI; A. Šemrov, *Die Fundmünzen der römischen Zeit in Slowenien* VI (Ljubljana 2010).

KLS I = *Krajevni leksikon Slovenije* 1 (Ljubljana 1968).

OPEL = B. Lőrincz, *Onomasticon provinciarum Europae Latinarum*, Vol. I: *Aba – Bysanus,* Budapest 2005^2; Vol. II: *Cabalicius – Ixus,* Wien 1999; Vol. III: *Labareus – Pythea,* Wien 2000; Vol. IV: *Quadratia – Zures,* Wien 2002.

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Rimske bronaste čelade republikanske dobe in zgodnjega principata v Sloveniji

UVOD

Najstarejše rimske čelade izhajajo iz bronastih[1] čelad, ki so jih v 4. st. pr. Kr. začeli izdelovati v Etruriji.[2] V literaturi zanje uporabljajo različna poimenovanja: etruščansko-italski (z gumbom na vrhu),[3] etruščansko-rimski[4] ali tip Montefortino[5] oziroma konične čelade z gumbom na vrhu.[6] Od 3. st. pr. Kr. do prve tretjine 1. st. pr. Kr. so bile sestavni del oborožitve rimskih vojakov.[7] V članku jih imenujem etruščansko-italske čelade.

Iz tradicije čelad etruščansko-italskega tipa izhajajo bronaste čelade tipov Buggenum in Haguenau,[8] ki so jih uporabljali rimski vojaki v drugi polovici 1. st. pr. Kr. in prvih dveh tretjinah 1. st. po Kr.[9]

"Manjkajoči člen" med etruščansko-italskimi čeladami in tipom Buggenum so verjetno bronaste čelade tipa Mannheim, ki so brez gumba na vrhu kalote in imajo podoben okras kot etruščansko-italske čelade.[10] Čeladam tipa Mannheim so približno sočasne in podobne (a lažje in skorajda neokrašene) bronaste čelade tipa Coolus. Zanje ni jasno, ali so keltske ali rimske. Del čelad tipa Coolus namreč izvira iz najdiščnih okoliščin, ki nakazujejo povezavo z Galci, za čelado tega tipa, ki je med najdbami z ladje, potopljene ok. 70 pr. Kr. pri Madrague de Giens (Francija), pa je jasno, da jo je nosil rimski vojak.[11]

V avgustejski dobi so Rimljani poleg bronastih čelad začeli uporabljati čelade tipa Weisenau, pri katerih je najpogosteje osnovni material železo.[12]

Iz Slovenije poznamo štiri čelade etruščansko-italskega tipa, en gumb čelade tipa Buggenum, čelado prehodnega tipa Buggenum/Haguenau in dve čeladi, pet gumbov in morda eno naličnico čelade tipa Haguenau. Večina naštetih čelad oz. njihovih delov še ni bila podrobno znanstveno obravnavana.

OPISI ČELAD[13]

1. Čelada etruščansko-italskega tipa iz Ljubljanice

(*sl. 1–2;* najdišče: *sl. 18:* 1; *t. 1*)

V reki Ljubljanici (pri Blatni Brezovici, ob ledini Tri lesnice; *sl. 18:* 1) je bila med podvodno arheološko topografijo leta 1984 najdena bronasta čelada (*t. 1; sl. 1*). Visoka je 223 mm, ima približno 1 mm debelo kaloto in tehta 1182 g. Hrani jo Narodni muzej Slovenije (inv. št. R 18915).[14]

Čelada je iz brona, ki vsebuje okoli 88 % bakra in okoli 12 % kositra, brez dodatkov svinca.[15] Na notranji strani so jasno vidni sledovi kovanja, očitni so tudi na rentgenskem posnetku (*sl. 2*). Čelada je

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[1] Besedo bron v članku uporabljam za zlitino bakra s kositrom, če je ugotovljena ali verjetna. Sicer za neopredeljene barvne kovine uporabljam izraz bakrova zlitina.

[2] Junkelmann 2000, 56; Pernet 2010, 72.

[3] Npr. Feugère 1994a, 37–41; Pernet 2010, 72–75.

[4] Schaaff 1988, 318–322.

[5] Junkelmann 2000, 52–65. Enako poimenovanje se uporablja za podobne keltske čelade s posebej narejenim vrhnjim gumbom (Pernet 2010, 72–73).

[6] Npr. Ortisi 2015, 27.

[7] Schaaff 1988, 318–322, 353, sl. 3; Egg et al. 1988, št. 110; Feugère 1993, 83–87, 118–119; Feugère 1994a, 37–41, 43, 45; Feugère 1994b, 10, 12, 20, sl. 8; Junkelmann 2000, 59–60; Pernet 2010, 72–75.

[8] V literaturi je pogosto navedeno nemško ime najdišča (Hagenau), ki leži na vzhodni meji Francije, v Alzaciji.

[9] Schaaff 1988, 325–326, 353–354; Waurick 1988, 327–333, 350–352; Pernet 2010, 75.

[10] Pernet 2010, 116–122 (z navedeno lit.).

[11] Pernet 2010, 116–122. V nasprotju s Pernetom menim, da ni dobrih pokazateljev za to, da bi bile čelade tipa Coolus starejše od čelad tipa Mannheim (prim. Pernet 2010, 118–119, sl. 83).

[12] Waurick 1988, 333–335, 352–353; Junkelmann 2000, 68–85; Pernet 2010, 76. Za datacijo začetkov tega tipa je pomemben čelada iz Oberadna (Müller 2006).

[13] Pri opisih se leva oziroma desna stran čelade nanašata na gledišče opazovalca, pri čemer je sprednji del čelade obrnjen proti gledalcu in je gumb (oz. vrh) čelade zgoraj.

V članku navedeni rezultati meritev se nanašajo na analitsko metodo vzbujanja karakterističnih rentgenskih žarkov pri obsevanju tarče s protoni (PIXE). Naredili smo jih na mestih, s katerih smo odstranili patino, razen če je navedeno drugače. Izvedel jih je Žiga Šmit na tandemskem pospeševalniku Instituta Jožefa Stefana (podrobneje o aparaturi: Istenič 2003, 197). Podani rezultati se nanašajo na masne odstotke.

[14] Istenič 2009a.

[15] Elementno sestavo kalote čelade smo merili na dveh mestih. Rezultati – mesto 1: Ni 0,3 %, Cu 88,1 %, As 0,1 0%, Pb 0,12 %, Sn 11,4 %; mesto 2: Ni 0,2 %, Cu 87,6 %, As 0,14 %, Pb 0,0 7 %, Sn 11,9 %. Podrobno o analizah te čelade: Šmit, Istenič 2018, C1.

narejena v enem kosu, vključno z votlim gumbom na vrhu in vratnim ščitnikom. V spodnjem delu kalote in na vratnem ščitniku so razpoke, ki so nastale med izdelavo.

Zunanja površina čelade je bila spolirana in je verjetno imela podoben videz kot po zaključku konservatorskega postopka leta 1985, ko so jo spolirali do rumenega kovinskega leska (*sl. 1a–d*).

Okrasi na gumbu in robu čelade ter na vratnem ščitniku so bili narejeni s punciranjem[16] (*sl. 1b–e*).

Na sredini vratnega ščitnika je 6 mm široka luknjica.

Na obeh straneh čelade je zanka, izrezana iz bronaste pločevine; ta poleg bakra vsebuje 4 oziroma 8 % kositra.[17] Zanki sta na kaloto pritrjeni s po dvema bakrenima[18] zakovicama in predstavljata zgornji del tečaja za pritrditev ličnega ščitnika.[19] V cevi tečaja na desni strani čelade je ohranjen del železne osi. Pred tečajema je na vsaki strani po ena, približno 4 mm široka luknja.

V primerjavi z drugimi čeladami etruščansko-italskega tipa je pri čeladi iz Ljubljanice neobičajno, da ima luknjico nad robom, pred prikovičeno zanko, na levi in desni strani čelade (*t. 1*). Podobno je le pri čeladi podtipa Montefortino/Canosa z neznanega najdišča, ki pa ima podobno luknjico tudi za prikovičeno zanko.[20]

Na spodnji strani vratnega ščitnika je grafit, ki verjetno predstavlja črko A (*sl. 2g*), na notranji površini kalote pa je grafit v obliki znakov XI (gledano proti vrhu čelade; *t. 1*).

2. Čelada etruščansko-italskega tipa s Kovačevš

(*sl. 3;* najdišče: *sl. 18:* 2; *t. 2*)

V izrazito nejasnih okoliščinah so domnevno na Kovačevšah, ki so del naselja Lokavec (severozahodno od Ajdovščine), našli številne odlomke kovinskih, keramičnih in steklenih predmetov iz obdobja med 5. st. pr. Kr. in 1. st. po Kr.[21] Na njih so sledovi namernega razbitja in deformiranja ter poškodbe, nastale v ognju, kar govori v prid domnevi, da predmeti izvirajo iz votivnega mesta[22] ali žganih grobov. Med kovinskimi predmeti so odlomki čelade.[23]

K čeladi zanesljivo sodijo štirje odlomki roba čelade z delom kalote in vrhnji gumb čelade (*sl. 3a–e;* rekonstrukcija na *t. 2*). Hranita jih Goriški muzej (gumb, inv. št. 16, *t. 2:* a; del vratnega ščitnika, inv. št. 43, *t. 2:* d) in Narodni muzej Slovenije (del sprednjega dela roba čelade, inv. št. P 12969a, *t. 2:* b; del roba čelade in kalote, inv. št. P 12969b, *t. 2:* e; velik del vratnega ščitnika z luknjo od zakovice, inv. št. P 12970, *t. 2:* c).

So iz zlitine bakra s približno 10 % kositra.[24] K čeladi so morda sodili še en velik in številni manjši, močno deformirani ter v ognju poškodovani odlomki, pri katerih debelina niha od 0,7 do 1,4 mm (*sl. 3*).[25]

Gumb čelade je votel (deb. sten na vratu 1,3 mm) in na zunanji strani okrašen s punciranim okrasom (*sl. 3a; t. 2*).

Okras na odlomku odebeljenega roba čelade kaže, da je s sredine sprednje strani čelade (*sl. 3b; t. 2*). Dva odlomka imata stično ploskev in sestavljata velik del vratnega ščitnika (*sl. 3c,d; t. 2*). Njegov rob ima v sredini približno trapezasto polje, okrašeno s punciranimi pikicami, sicer pa je rob čelade okrašen s punciranimi poglobljenimi poševnimi linijami, ki so usmerjene proti okrasu v sredini vratnega ščitnika in krasijo tudi druge odlomke roba čelade. Na vratnem ščitniku sta še

[16] Opis tehnike punciranja: Braun-Feldweg 1988, 184.

[17] Rezultati meritev na levi zanki: Ni 0,6 %, Cu 95,1 %, As 0,06 %, Pb –, Sn 4,3 %; rezultati meritev na desni zanki: Ni 0,3 %, Cu 91,7 %, As 0,35 %, Pb 0,08 %, Sn 7,6 %. Podrobno o analizah te čelade: Šmit, Istenič 2018, C1.

[18] Rezultati meritev – zakovica na levi strani: Ni 0,3 %, Cu 99,3 %, As 0,04 %, Pb 0,15 %, Sn 0,2 %; zakovica na desni strani: Ni 0,4 %, Cu 99,1 %, As 0,41 %, Pb 0,07 %, Sn –. Podrobno o analizah te čelade: Šmit, Istenič 2018, C1.

[19] Prim. čelade etruščansko-italskih tipov z ohranjenimi ličnimi ščitniki, npr. Junkelmann 2000, 58, 59, in Junkelmann, Thüry 2000, 94–96, sl. 7–8, 11, 27, t. 1, 2, 3, kat. AG 193, AG 323, AG 425, AG 441.

[20] Born 1991, t. 13; Junkelmann, Thüry 2000, 106, sl. 29.

[21] Svoljšak 1983, 5–6. Precej možno se zdi, da je bila jama, ki je bila odkrita leta 1945 in v kateri so arheologi našli prazgodovinske in zgodnjerimske predmete, izkopana v 20. stoletju (malo pred odkritjem leta 1945?) in da so vanjo nasuli predmete, ki so jih našli v okolici (Svoljšak, ustna informacija 30. 8. 2017).

[22] Gleirscher 2002, 258, kat. 187; Božič 2011, 262.

[23] Svoljšak 1983, 19–20, 23, št. 11, 42–43, 116–118, t. 5: 153–157 (v objavi manjka navedba, da opisa št. 116 in 117 ustrezata risbama t. 5: 157 in t. 5: 155); Guštin 1991, 22–23, 52, t. 42: 2.

[24] Rezultati meritev: odlomek P 12969: Fe 0,31 %, Ni 0,11 %, Cu 88,7 %, As 0,11 %, Sn 10,8 %, Pb –; odlomek P 12970: Fe 0,31 %, Ni 0,17 %, Cu 89,5 %, As 0,08 %, Sn 9,9 %, Pb –.

[25] Goriški muzej, inv. št. 39, 40. Del odlomkov, ki jih hrani ta muzej, zanesljivo ni od čelade (npr. profiliran odlomek ter odlomek z majhno luknjico in nakazano drugo luknjico – luknjici sta namreč premajhni in preblizu skupaj, da bi lahko bili luknjici za pritrditev tečaja za lični ščitnik).

dve okrasni liniji, sestavljeni iz punciranih pikic. V sredini vratnega ščitnika, tik nad odebeljenim robom, je luknja nepravilne (približno rombične) oblike, velika približno 5 × 6 mm (*sl. 3c*).

Dva odlomka sestavljata stranski del roba čelade in kalote; debelina sten kalote meri 1,1 do 1,5 mm (*sl. 3e; t. 2*).

3. Čelada etruščansko-italskega tipa iz okolice Sv. Antona

(*sl. 4;* najdišče: *sl. 18:* 3; *t. 3*)

Z gradišča pri Sv. Antonu verjetno izvira bronasta čelada (*sl. 4*). Najdiščne okoliščine so slabo poznane.[26] Čelada je visoka 204 mm in tehta 916,3 g. Hrani jo Deželni muzej v Gradcu.

Narejena je v enem kosu, vključno z votlim gumbom na vrhu. Ni še bila konservirana. Na zunanji površini je neenakomerna patina: rjava, temno zelenorjava, na majhnih delih izrazito zelena. Poleg tega je deloma na površini beige kalcitna siga (reagira z raztopino HCl). Na delih s temno zelenorjavo patino je površina izrazito gladka, kar nakazuje, da je bila spolirana.

Na notranji površini kalcitna siga prekriva dosti večji del površine in je najbolj izrazita v gumbu in na zgornjem delu čelade. Najmanj na enem mestu je na površini temno zelenorjava patina z gladko površino. Slutiti je sledove kovanja, ki tečejo vodoravno od gumba navzdol; kovanje nakazuje tudi neenakomerna debelina kalote.

Čelada je bila udarjena na več mestih: na desni strani zadaj (pribl. 65 mm dolg raven odtis) in nad vratnim ščitnikom, kjer je kalota v dolžini pribl. 2 cm prebita (debelina kalote na tem mestu je slab milimeter), ter bolj topo in plitvo na levi strani. Poleg tega je kalota počena približno v sredini na levi strani.

Gumb ni okrašen; na zgornji strani ima v sredini približno 3 mm široko in približno 1 mm globoko poglobitev.

Na levi in desni strani čelade sta po dve luknji, še ena je nad odebeljenim robom približno sredi sprednjega dela čelade in ena približno v sredini vratnega ščitnika. Njihov premer je okoli 4 mm.

Vsi okrasi so narejeni v tehniki punciranja.

Na dnu kalote približno vzporedno tečejo trije žlebiči, ki omejujejo dva pasova, okrašena s poševnimi linijami. Linije v spodnjem pasu oblikujejo motiv smrekove vejice brez sredinske vodoravne linije.

Rob čelade in kratek vratni ščitnik sta odebeljena (deb. pribl. 3 oz. 2 mm). Razen na osrednjem delu vratnega ščitnika in v sredini sprednjega dela čelade je rob čelade okrašen s po dvema vzporednima punciranima linijama v neenakomernih razmikih; sredi čelnega dela se te linije srečajo in sestavljajo trapezasto polje, okrašeno s punciranimi linijami, na robu vratnega ščitnika pa so puncirani krožci, ki jih zgoraj in spodaj omejujeta poglobljeni liniji. Vratni ščitnik poleg tega krasi motiv valovitih vitic (*Wellenranke*; *sl. 4c*), ki jih (na desni strani, kjer so dobro ohranjene) omejujeta zunanja in notranja linija, zapolnjene so s pikicami. Na eni strani je pet volut, na drugi strani le tri (od zadnje je zelo malo ohranjenega); usmerjene so zrcalno, k sredini vratnega ščitnika.

Ni jasno, zakaj je Reinecke menil, da je bila na istem najdišču kot čelada, ki jo hrani Deželni muzej v Gradcu, najdena bronasta čelada iz nekdanje

[26] Archäologie und Münzkabinet, Universalmuseum Joanneum GmbH, inv. št. 10077 (kasneje nova inv. št.: 18102). V inventarni knjigi (pri inv. št. 10077) piše, da čelada izvira iz *S. Antonius bei Pirano*, v *Jahresbericht Joanneum* 1900 (str. 32) pa je poleg najdišča (*gefunden zu St. Antonius bei Pirano*) navedeno, da je bila čelada kupljena.

Reinecke (1942, 190–191, op. 132) je domneval, da je najdišče čelade *15 km südlich von Triest gelegene Monte S. Antonio,* na katerem Marchesetti (1903, 73) omenja slabo ohranjeno najdišče: *Ben poco, come dissi, si conservò del castelliere di S. Antonio, posto al di sopra dell'omonimo villaggio (357 metri). Ridotto in buona parte a coltura, le sue cinta sono quasi complettamente distrutte, sicchè non è possibile rilevarne la forma. Solo i cocci disseminati scarsamente per i campi, ci fanno fede dell'esistenza dell'uomo preistorico*.

Gradišče, ki ga omenja Marchesetti, leži na 356 m visokem hribu južno od naselja Dvori in pribl. 2 km jugovzhodno od naselja Sv. Anton (Truhlar 1975). Na sodobnih zemljevidih ime hriba ni navedeno, vendar ga domačini imenujejo Sv. Anton oziroma Hrib (vir: pismo Mateja Župančiča z dne 21. 5. 1997; hrani arhiv Inštituta za arheologijo ZRC SAZU (*Arheološki kataster Slovenije: ARKAS* ID 040109.11 [http://arkas.zrc-sazu.si]).

Reinecke ni utemeljil svoje domneve o najdišču čelade na gradišču, ki ga omenja Marchesetti. Ni nemogoče, da čelada izvira z gradišča severno od naselja Sv. Anton, ki se imenuje Kortina (kota 257 m). Na njem so ugotovili trojno prazgodovinsko obzidje, odlomke prazgodovinske keramike in bronasto bodalo z začetka bronaste dobe ter ostanke rimskih stavb (zidovi v suhozidni tehniki, strešniki in opeka) in vodnega zbiralnika (Strenar, Šribar 1974). Ni izključeno, da se je ime vzpetine z ostanki gradišča spremenilo po drugi svetovni vojni. Na spreminjanje imen v Sv. Antonu in okolici kaže podatek v *KLS* I (141–142): "Pridvor, prejšnji Sv. Anton pri Kopru".

Ne nazadnje ni jasno, ali je bila čelada najdena v kraju Sv. Anton (manj verjetno) ali na enako imenovanem gradišču v okolici. Navedba v *Jahresbericht Joanneum* 1900, 32 (*zu St. Antonius*), kaže na naselje, vendar so takrat kot najdišče pogosto navajali najbližje naselje dejanskega najdišča.

zbirke Franza von Lipperheide, za katero Schaaff kot najdišče navaja Istro.[27]

4. Čelada etruščansko-italskega tipa z Gradu pri Krnu

(*sl. 5–9;* najdišče: *sl. 18:* 4)

Pred kratkim so na Gradu pri vasi Krn v dolini Soče[28] našli močno deformirano čelado (*sl. 5*).[29] Neenakomerna zelena in zelenosiva patina na površini ne kaže, da bi bila čelada v ognju. Čelada je visoka 204 mm, tehta 746 g in je iz zlitine bakra s približno 6 % kositra.[30] Hrani jo Tolminski muzej (inv. št. TM 2650).

Čelada še ni bila konservirana. Narejena je v enem kosu. Na notranji površini je opaziti sledove kovanja, na zunanji površini pa so, pod mikroskopom, slabo vidni sledovi poliranja.

Pločevina kalote je zelo tanka (manj kot 1 mm) in na vrhu preide v približno 24 mm širok gumb z drobnim punciranim okrasom na obodu (*sl. 6g*).

Poševno ležeč vratni ščitnik je dolg 28 mm in se počasi začne širiti iz kalote takoj za mestoma ob straneh kalote, kjer sta bili nanjo pritrjeni zanki tečaja.

Rob čelade (vključno z vratnim ščitnikom) je odebeljen (največja debelina okoli 4,5 mm) in okrašen: na sprednjem delu je 106 mm dolg simetričen punciran okras (v sredini navpične linije, levo in desno od nje motiv smrekove vejice oziroma palmine veje z izrazito sredinsko vodoravno linijo; *sl. 6i*, ki mu na obeh straneh sledijo različno dolge (pribl. 10 do 38 mm) puncirane, poševno ležeče linije, delno ohranjene tudi na vratnem ščitniku (*sl. 6h,j; 8*). Okoli 6 mm nad odebeljenim robom kalote oz. na zadnji strani nad pregibom v vratni ščitnik je približno 11 mm visok punciran okras rahlo usločenih in simetrično ležečih linij, ki oblikujejo motiv smrekove vejice brez sredinske vodoravne linije (*sl. 6i*).

Poleg opisanega okrasa so na vratnem ščitniku drobne, približno 3 mm dolge poševne puncirane linije neposredno nad robom (ohranjeno na desni strani; *sl. 5d*) in slabo vidni ostanki punciranega okrasa, ki je prikazoval valovite vitice (*sl. 7n; 8*). Ta okras je na levi strani vratnega ščitnika viden na več mestih, ki kažejo, da je bil okras sestavljen iz štirih vitic, orientiranih proti sredini vratnega ščitnika. Vitice na eni strani omejuje puncirana linija, njihov drugi rob pa nakazuje zunanja linija površine, okrašena s punciranimi pikicami. Komajda ohranjen delček punciranega okrasa ob sredini, vendar že na levi strani vratnega ščitnika (*sl. 7n; 8, 9*) nakazuje, da je sredino vratnega ščitnika, verjetno nad luknjo zakovice, krasil drug motiv (ne vitice), narejen v enaki tehniki.

Preizkus z magnetom je pokazal, da so ostanki zanke (za pritrditev ličnih ščitnikov) na notranji levi strani čelade (*sl. 6l*) in po dve zakovici s približno 10 mm velikimi glavicami (*sl. 6h,j,k*) iz železa. S to ugotovitvijo se ujema izrazita železova rja na približno simetrično ležečem delu notranje in zunanje površine na obeh straneh čelade. Ohranjeni del zanke in njeni sledovi na površini kalote kažejo, da je bila dolga približno 51 mm in je ob kaloti segala približno 22 mm visoko (ocena debeline pločevine: 2–3 mm).

5. Čelada tipa Buggenum/Haguenau iz Ljubljanice

(*sl. 10–12;* najdišče: *sl. 18:* 5; *t. 4*)

Iz Ljubljanice pri Vrhniki izvira 193 mm visoka in 1136 g težka čelada, pri kateri debelina spodnjega dela kalote meri približno 1 mm.[31] Narejena je iz

[27] Reinecke 1942, 190–191, op. 132; Schaaff 1988, 525, kat. 109.

[28] Na (doslej nepoznanem) najdišču so nepooblaščeni iskalci z detektorjem kovin našli številne predmete mladohalštatske in poznolatenske dobe, ki vključujejo več posod iz bakrove zlitine (med drugim situli iz mlajšega dela starejše železne dobe in vrček tipa Idrija iz obdobja med drugo polovico/zadnjo tretjino 2. st. in 80/60 pr. Kr. – prim. op. 143), nakit ("bronaste" košaraste obeske, odlomke zapestnic, steklene jagode s plastovitimi očesci) in najverjetneje številne železne predmete, med drugim odlomka poznolatenskih mečev (LT D1), odlomek poznolatenske nožnice (LT D1) in tri odlomke poznolatenskih mečev v nožnici (LT D1), mladohalštatske tulaste in uhate sekire, poznolatenske uhate sekire in številne sulične osti. Predmete hranita Tolminski muzej in Narodni muzej Slovenije. Prim. Laharnar, Turk 2017, 170, sl. 197.

[29] Zlatar in srebrokovač, izučen v tradicionalnih zlatarskih in srebrokovaških tehnikah, izdelovalec unikatnih izdelkov Christoph Steidl Porenta (Ljubljana) meni, da je deformacijo povzročila zelo velika sila. Morda je poškodba nastala tako, da so na čelado, ležečo na strani, spustili težak predmet. Podobno, a še močneje, je bila namerno poškodovana npr. zgodnjelatenska čelada z najdišča Vasella di Domegge v Benečiji (Italija; Marzatico, Gleirscher 2004, 681–682, kat. 8.25).

[30] Zlitino smo analizirali na enem mestu; rezultati: Fe 0,16 %, Ni –, Cu 93,9 %, As –, Sn 5,86 %, Pb 0,10 %.

[31] Istenič 2009h, 282–283, kat. 76.

brona, ki vsebuje okoli 10 % kositra.[32] Shranjena je v Narodnem muzeju Slovenije (inv. št. V 1950).

Kalota, gumb na vrhu in vratni ščitnik so narejeni v enem kosu. Na notranji strani čelade so vidni krožno po obodu, od gumba navzdol potekajoči sledovi (*sl. 10*), ki jasno kažejo, da je čelada nastala s kovanjem; to potrjuje rentgenski posnetek (*sl. 12h*). Razpoki na gumbu (*sl. 11a,d*) sta verjetno nastali med izdelavo. Pravilni, vzporedni vodoravni sledovi na zunanji strani čelade kažejo na poliranje zunanje površine (npr. s plovcem) na vretenu.

Gumb na vrhu kalote ima zgoraj navpično zarezo V-preseka in ob straneh vodoravno ležeči luknjici, ki se stožčasto zožita proti notranjosti gumba in ne segata do navpične zareze (*t. 4*). Na notranji strani je gumb zapolnjen s trdo sivo snovjo (*sl. 10; 11f*), ki je najverjetneje zlitina svinca s kositrom.[33]

Rob kalote je odebeljen.

Ni sledov, iz katerih bi lahko sklepali, da je čelada imela čelni ščitnik.

Ob straneh in na zadnji strani (*sl. 11b–d*) so bili na kaloto z zlitino kositra in svinca[34] prispajkani nosilci okrasa iz čiste medenine z okoli 22 % oziroma 14 % cinka.[35]

Na spodnji strani ob straneh (*sl. 11b,d*) sta s po dvema bakrenima[36] zakovicama na notranjo stran čelade pritrjeni zanki, ki sta zgornja dela tečaja za pritrditev ličnih ščitnikov. Izrezani sta iz bronaste pločevine, ki vsebuje okoli 5 % kositra.[37]

V cevi tečaja na desni strani čelade je železova rja – verjetno ostanki železne osi tečaja. Lična ščitnika nista ohranjena.

Na spodnji strani vratnega ščitnika je punciran napis P. OPPI > CRACCI (*sl. 12g*).

Luknja v sredini vratnega ščitnika (*sl. 11e*) kaže, kje je bil z zakovico pritrjen okov z obročkom za obešanje čelade.

6. Čelada tipa Haguenau iz Mušje jame pri Škocjanu

(*sl. 13;* najdišče: *sl. 18:* 6; *t. 5*)

V Mušji jami pri Škocjanu, na vrhu kamnitega stožca s prazgodovinskimi votivnimi darovi (11.–8. st. pr. Kr.),[38] je bila najdena bronasta čelada[39] (*sl. 13; t. 5*). Visoka je 203 mm. Hrani jo Mestni umetnostnozgodovinski muzej v Trstu (Civico Museo di Storia ed Arte Trieste), inv. št. 40760.

Na kaloti sta dve izraziti udrtini, zadaj in na desni strani. Na površini je neenakomerna temno zelena patina in na več mestih siva hrapava plast, za katero domnevam, da je siga.

Kalota ima tenke stene (deb. pribl. 1 mm) in odebeljen rob (deb. 3–4 mm). Na notranji površini so jasni sledovi (neenakomernega) kovanja. Zunanja površina je na mestih z dobro ohranjeno patino izrazito gladka, kar kaže na to, da je bila zunanja površina spolirana.

Gumb na vrhu čelade je narejen v enem kosu s kaloto in je votel (*sl. 13f*) ter ima izrazito tenke stene (približno enako kot kalota). Na desni strani je tako močno poškodovan, da je izgubil prvotno obliko in da je vrat prelomljen. Gumb je z vrha navpično preklan tako, da je nastala približno 26 mm dolga navpična zareza V-preseka, ki ima zgoraj na obeh straneh komajda nakazan krožni izrez. Na levi in desni strani sta pod vrhom gumba približno 12 mm dolgi vodoravni zarezi, ki sta prebili debelino pločevine (*t. 5*).

Spredaj sta nad robom kalote približno 4 mm široki luknji (*sl. 13a,d*), ki sta bili izbiti z zunanje

[32] Meritev kalote je bila narejena na enem mestu; rezultati: Fe 1,7 %, Ni 0,3 %, Cu 87,2 %, As 0,14 %, Pb –, Sn 10,5 %. Podrobno: Šmit, Istenič 2018, C2.

[33] Temno sive snovi v gumbu čelade nismo mogli doseči s protonskim žarkom, zato smo njeno približno elementno sestavo skušali ugotoviti tako, da smo jo na majhnem delu postrgali in obrisali s kosmom vate, tega smo nato merili. Rezultati kažejo na zlitino svinca in kositra, v kateri verjetno prevladuje svinec. Podrobno o analizah te čelade: Šmit, Istenič 2018, C2.

[34] Meritev nakazuje, da je bilo razmerje kositra in svinca v lotu 1 : 1. Podrobno o analizah: Šmit, Istenič 2018, C2.

[35] Na vsakem nosilcu smo naredili po eno meritev. Rezultati meritev na nosilcu na levi strani: Fe 1,3 %, Ni 0,2 %, Cu 75,0 %, Zn 22,4 %, As 0,08 %, Se –, Pb 0,25 %, Ag 0,25 %, Sn 0,25 %; rezultati meritev na nosilcu na desni strani: Fe –, Ni 0,2 %, Cu 76,1 %, Zn 23,2 %, As –, Se –, Pb 0,07 %, Ag 0,11 %, Sn 0,4 %; rezultati meritev na nosilcu zadaj: Fe –, Ni 0,1 %, Cu 85,5 %, Zn 14,0 %, As 0,03 %, Se 0,11 %, Pb 0,11 %, Ag 0,04 %, Sn 0,2 %. Podrobno o analizah: Šmit, Istenič 2018, C2.

[36] Rezultati meritev na dveh zakovicah na mestih Cu 99,2 oz. 99,4 %. Podrobno o analizah: Šmit, Istenič 2018, C2.

[37] Rezultati meritev na dveh mestih: Fe –, Ni 0,5 %, Cu 93,5 %, Zn –, As 0,19 %, Se –, Pb 0,44 %, Ag –, Sn 5,4 % in Fe 1,9 %, Ni 0,6 %, Cu 92,2 %, Zn –, As 0,18 %, Se –, Pb 0,37 %, Ag –, Sn 4,7 %. Podrobno o analizah: Šmit, Istenič 2018, C2.

[38] Teržan 2016, 403–404.

[39] Szombathy 1912, 168–169, fig. 180–181; Kubitschek 1912; Degrassi 1929, 177–179 = Degrassi 1962,742–745, štiri fotografije na sl. med str. 436 in 437; Marzatico, Gebhard, Gleirscher 2011, 371, 647, kat. 7.27; Maggi 2005; Vidulli Torlo 2008; Borgna et al. 2016, 672, t. 68, 86. Hrani jo Mestni umetnostnozgodovinski muzej v Trstu (Civico Museo di Storia ed Arte Trieste), inv. št. 40760.

strani čelade in ne ležita povsem simetrično glede na sredinsko os čelade; namenjeni sta bili pritrditvi čelnega ščitnika (ni ohranjen).

Na levi in desni strani sta nad robom kalote po dve verjetno bronasti (material se po videzu ne razlikuje od materiala, iz katerega je čelada) zakovici (*sl. 13b,d*), ki sta pritrjevali zanko, na katero sta bila obešena lična ščitnika (nista ohranjena). Zakovici imata na zunanji površini glavico nizkega D-preseka, na notranjo stran čelade pa približno 5 mm daleč segata njuna trna s premerom okoli 4 mm (*sl. 13f*). Na notranji površini ni videti sledov zank, ki so jih zakovice pripenjale.

Nad zakovicama na levi strani, na površini približno 40 × 28 mm, je siva hrapava površina (*sl. 13b*), za katero domnevam, da je siga.

Vratni ščitnik se razširi in je rahlo poševen. Na njem sta 4 oz. 6 mm široki luknji, ki sta bili izbiti s spodnje strani in ne ležita povsem simetrično glede na sredinsko os čelade (*sl. 13c*); ni jasno, čemu sta služili.

Približno v sredini vratnega ščitnika je na zgornji in spodnji strani močno zarjavela površina (*sl. 13c,f,g*) (zgornja površina pribl. 18 × 20 mm), verjetno ostanek železne zakovice. Namenjena je bila verjetno pritrditvi okova (z obročkom za obešanje čelade) na spodnjo stran ščitnika (od tega okova ni prepoznavnih sledov).

Ostale luknje na vratnem ščitniku najverjetneje niso bile narejene namenoma, ampak so nastale zaradi propadanja čelade.

Na zgornji ploskvi vratnega ščitnika sta dva puncirana napisa (*sl. 13g; t. 5*): .>.CAESIDIENI.C.TOMIVS (ob robu kalote) in .>.POSTVMI.M.VALERI.BACINI (ob zunanjem robu ščitnika). Črke in pikice napisa ob zunanjem robu ščitnika so večje kot pri napisu ob kaloti. Pri tem napisu črki A in L (v Valeri) deloma prekriva rja, ki je nastala zaradi železne zakovice v sredini ščitnika.

Rentgenski posnetki čelade niso bili narejeni.

7. Čelada tipa Haguenau iz Save pri Mokricah (?)

(*sl. 14;* najdišče: *sl. 18:* 7; *t. 6*)

Tipu Haguenau prav tako pripada čelada, ki naj bi bila najdena v reki Savi pri Mokricah (*sl. 14*) in jo hrani Hrvatski povijesni muzej (inv. št. 31408).[40]

Razmeroma masivna (teža 1470 g) bronasta čelada je visoka 150 mm. Kalota ima neenakomerno debele stene (0,5–1,5 mm) in odebeljen rob. Čelada je dobro ohranjena, čeprav je kalota na več mestih deformirana – najbolj izrazita je vdrtina na desni strani. Na površini ima izrazito rjavo in zeleno patino, pod katero so na notranji površini kalote očitni sledovi kovanja/tolčenja.

Čelada nima vrhnjega gumba. Prav tako ni sledov pripenjališč nastavkov za okras na straneh in zadnji strani čelade. Na desni strani čelade je ohranjena zanka, ki predstavlja zgornji del tečaja, s katerim je bil na čelado pripet lični ščitnik. Zanka je iz bakrove zlitine in je bila ulita. V notranjosti cevastega dela je ohranjena paličasta os tečaja (*t. 6*) – zaradi izrazite patine ni jasno, ali je iz železa ali iz bakrove zlitine. Zanka nalega na notranjo površino čelade, na katero je z dvema zakovicama pritrjena z zunanje strani. Zakovici sta iz bakra ali bakrove zlitine in imata stožčasti glavici. Na levi strani čelade sta se ohranili le približno 5 mm široki luknjici dveh zakovic.

Čelni ščitnik je bil ulit in je na kaloto pripet s tremi zakovicami iz bakra ali bakrove zlitine: dve sta ob straneh čelade in imata dobro vidni glavici zakovic na zunanji strani čelade, ena pa je spredaj in je vidna le na notranji površini čelade.

Vratni ščitnik je narejen v enem kosu s kaloto. V sredini ima luknjo, v kateri je zakovica iz bakra ali bakrove zlitine s polkrožno glavico na zgornji strani. Sega čez vratni ščitnik in približno 1 mm debelo okroglo podložko iz bakra ali bakrove zlitine na spodnji strani. Na zgornji strani vratnega ščitnika je punciran napis C.MATI. CHO.III. >.P.MVSSI. TAVRI.; med prvim imenom in kohorto je slabo viden punciran venec (*t. 6; sl. 14e*).

8.–10. Gumbi čelad tipa Buggenum in Haguenau z najdišča Ljubljana – Šumi

(*sl. 15:* 8–10; najdišče: *sl. 18:* 8–10; *t. 7:* 8–10)

Iz poznoavgustejsko-tiberijskih plasti najdišča Ljubljana – Šumi (na levem bregu Ljubljanice) izvirajo trije vrhnji deli bronastih čelad.[41] Vsi gumbi imajo tenke stene in so narejeni v enem kosu s kaloto, iz brona, ki vsebuje okoli 12 % kositra.

[40] Hoffiler 1937, 31–32, sl. 4a,b. Čelada je bila del zasebne zbirke Milana Praunspergerja, po drugi svetovni vojni pa je prišla v Hrvatski povijesni muzej. Najdiščnih podatkov, ki jih navaja Hoffiller (l. c.), mi ni uspelo preveriti.

[41] Gaspari 2010, 90, 94, t. 28: Š 1181,Š 899,Š 1307. V objavi je navedeno, da izvirajo iz "zgodnjerimskih depozitov". Datacija v poznoavgustejsko--tiberijsko dobo izhaja iz širšega konteksta objave. Predmete hrani Mestni muzej Ljubljana, inv. št. 510:LJU;0056907, 510:LJU;0056908, 510:LJU;0056909.

– Št. 8 (tip Buggenum):

Gumb kroglaste oblike, ki ima na vrhu okoli 3 mm široko in milimeter globoko poglobitev, in del kalote (*sl. 15:* 8; *t. 7:* 8) (teža 35,19 g; ohranjena viš. 41 mm; deb. sten kalote pribl. 1 mm), bron z okoli 13% kositra.[42] Hrani Mestni muzej Ljubljana, inv. št. 510:LJU;0056907.

– Št. 9 (tip Haguenau):

Stožčasto oblikovan gumb čelade in majhen del kalote (*sl. 15:* 9; *t. 7:* 9) (teža 16,70 g; ohranjena viš. 32 mm; deb. sten vratu okoli 1,3 mm; deb. stene kalote okoli 1 mm), bron z okoli 12% kositra.[43] Hrani Mestni muzej Ljubljana, inv. št. 510:LJU;0056908.

– Št. 10 (tip Haguenau):

Odlomek vrhnjega dela kalote z gumbom v obliki prisekanega stožca (*sl. 15:* 10; *t. 7:* 10) (teža 19,45 g; ohranjena viš. odlomka 42 mm; deb. sten vratu in kalote pribl. 1 mm), bron z okoli 13% kositra.[44] Hrani Mestni muzej Ljubljana, inv. št. 510:LJU;0056909.

11.–12. Gumb čelade tipa Haguenau in lični ščitnik z najdišča Ljubljana – Tribuna

(*sl. 15:* 12; *16;* najdišče: *sl. 18:* 11,12; *t. 7:* 12)

Na najdišču Ljubljana – Tribuna (na desnem bregu Ljubljanice) so raziskali ostanke dveh zaporednih vojaških taborov iz srednje- in poznoavgustejske, morda še zgodnjetiberijske dobe. Med najdbami, ki jih povezujejo s starejšim taborom (datacija: po letu 10 pr. Kr.–začetek poznoavgustejske dobe), je vrhnji gumb, lični ščitnik čelade pa je med najdbami iz mlajšega tabora (datacija: od okoli leta 5 po Kr. do konca poznoavgustejske ali začetka tiberijske dobe).[45]

– Št. 11:

Gumb (*sl. 16*) iz bakrove zlitine je bil – glede na objavljeno fotografijo – ulit in na vrh čelade prispajkan.[46]

– Št. 12:

Desni lični ščitnik (*sl. 15:* 12) (viš. 163 mm; deb. pločevine na robu pribl. 0,5 mm; teža 137,45 g) je skovan iz bronaste pločevine, ki vsebuje približno 8,5 % kositra. Na zunanji strani, ki je bila morda pokositrena, je žlahtna temno zelena patina z zelo gladko površino, na notranji strani pa je poleg podobne patine temno sivozelena patina z rahlo grobo površino.[47]

Na sprednjem delu (ki ni v celoti ohranjen; *sl. 15:* 12a; *t. 7:* 12a) ima dva izreza, obrobljena s približno 12 mm širokim izbočenim pasom pločevine. Ostali robovi imajo obliko približno 7 mm široke in 3 do 5 mm visoke stopnice. Na zgornjem robu sta 30 oz. 36 mm široki zanki (del tečaja, namenjenega pritrditvi ščitnika na čelado). Sprednja zanka, nad polkrožnima izrezoma, je cela (dolž. 30 mm; premer pribl. 7 mm), pri drugi (dolž. 36 mm) je proti notranji ploskvi ščitnika zavita površina cevke le delno ohranjena. Os tečaja ni ohranjena.

Na spodnjem delu zunanje strani ščitnika so ostanki glave bakrene[48] zakovice (sredina 17 mm od spodnjega roba), od katere se je na notranji strani ohranil pretežni del bakrenega[49] trna (dolž. 8 mm; *sl. 15:* 12b; *t. 7:* 12b). Zakovica je na notranjo stran ščitnika verjetno pritrjevala zanko iz

[42] Rezultati analize: Fe 0,26 %, Cu 86,9 %, As –, Se –, Br –, Ag –, Sn 12,7 %, Au –, Pb 0,13; patina na zunanji površini: Fe 4,12 %, Cu 58,4 %, As 0,10 %, Se –, Br –, Ag –, Sn 37,1 %, Au –, Pb 0,23 %; patina na notranji površini; Fe 3,06 %, Cu 60,2 %, As 0,09 %, Se –, Br –, Ag –, Sn 36,10 %, Au –, Pb 0,22 %.

[43] Rezultati analize: Fe 0,22 %, Cu 87,5 %, As 0,11 %, Se –, Br –-, Ag –, Sn 12,2 %, Au –, Pb –; patina na zunanji površini: Fe 1,31 %, Cu 49,2 %, As 0,46 %, Se –, Br –, Ag –, Sn 48,9 %, Au –, Pb 0,18 %; patina na notranji površini : Fe 2,03 %, Cu 58,5 %, As 0,52 %, Se –, Br –, Ag –, Sn 36,60 %, Au –, Pb –, Cr 2,34 %.

[44] Rezultati analize: Fe 0,22 %, Cu 87,0 %, As 0,02 %, Se –, Br –, Ag –, Sn 12,7 %, Au –, Pb 0,04 %; patina na zunanji površini: Fe 1,00 %, Cu 73,6 %, As 0,05 %, Se 0,059 %, Br –, Ag –, Sn 25,1 %, Au –, Pb 0,21 %; patina na notranji površini: Fe 2,65 %, Cu 62,2 %, Zn 0,34 %, As 0,05 %, Se 0,08 %, Br –, Ag –, Sn 34,30 %, Au –, Pb 0,30 %. Visoki odstotki kositra, izmerjeni v patini na zunanji in notranji površini, so verjetno posledica korozijskih procesov (Meeks 1993; Šmit et al. 2005, 229–239.

[45] Hvalec et al. 2009, 4; Gaspari et al. 2014, 138–143; Gaspari 2014, 131–133, sl. 139. Predmeta začasno hrani ARHEJ, d. o. o.

[46] Konec avgusta 2017 predmet ni bil dosegljiv, zato ni bilo mogoče narediti risbe, ga podrobno opisati, ugotoviti ostanke spajke na spodnji strani niti njegove elementne sestave.

[47] Elementna sestava: Fe 0,11 %, Ni 0,18 %, Cu 91,1 %, Zn –, As 0,08 %, Ag –, Sn 8,54 %, Sb –, Pb -, Mn –; zelena patina na licu – Fe 3,53 %, Ni 0,17 %, Cu 52,9 %, Zn 0,37 %, As 0,20 %, Ag –, Sn 42,6 %, Sb –, Pb 0,23 %, Mn – ; siva patina na notranji strani – Fe 1,94 %, Ni –, Cu 84,8 %, Zn –, As 0,10 %, Ag –, Sn 13,0 %, Sb –, Pb 0,10 %, Mn – . Visoki odstotki kositra, izmerjeni v patini na licu ščitnika, so lahko posledica korozijskih procesov (Meeks 1993; Šmit et al. 2005, 229–239) ali pa kositrenja površine.

[48] Rezultati analize: Fe 0,53 %, Ni –, Cu 99,3 %, Zn –, As –, Ag –, Sn 18 %, Sb –, Pb 0,04 %, Mn –.

[49] Rezultati analize: Fe 0,47 %, Ni –, Cu 99,5 %, Zn –, As –, Ag –, Sn –, Sb –, Pb –, Mn –.

bronaste[50] pločevine, od katere sta se ohranila spodnji (ohranjena dolž. 22 mm; največja šir. 12 mm) in zgornji del (ohranjena šir. in dolž. 8 mm), sama zanka (zavoj) pa ne. V zanko je bil verjetno vdet obroček, ki je služil za pritrditev (usnjenega) jermena; jermen levega in jermen desnega ličnega ščitnika sta bila zavezana/speta pod brado.[51]

Druge zakovice nakazujejo luknje na ščitniku. Vse so bile udarjene z lica. V vogalih zgornjega dela sta večji luknji (prem. 3,5 oz. 5 mm), devet manjših (prem. 2–3 mm) je razporejenih ob robu in ena približno v sredini ščitnika. Nič ne kaže, da bi bila katera od teh lukenj povezana s pritrditvijo okrasa,[52] zato domnevam, da je bila na hrbtno stran ščitnika pritrjena (usnjena) podloga.

13. **Gumb čelade tipa Haguenau s Strmce pri Povirju**

(*sl. 15:* 13; najdišče: *sl. 18:* 13; *t. 7:* 13)

Na notranjem pobočju južnega obzidja Strmce, ki je osrednji vrh prazgodovinskega gradišča s tremi vrhovi jugovzhodno od Povirja,[53] je nepooblaščen iskalec z detektorjem kovin našel masiven (poln) vrhnji gumb čelade (viš. 37 mm; teža 68,61 g) iz svinčevega brona[54] (*sl. 15:* 13). Ostanki spajke[55] na spodnji strani gumba jasno kažejo, da je bil gumb na vrh kalote prispajkan z zlitino kositra in svinca. Hrani ga Narodni muzej Slovenije (inv. št. R 27126).

TIPOLOŠKO-KRONOLOŠKA OPREDELITEV ČELAD

Etruščansko-italskim čeladam pripadajo čelade iz Ljubljanice (*sl. 1; 2; t. 1*), s Kovačevš (*sl. 3; t. 2*), iz okolice Sv. Antona (*sl. 4; t. 3*) in z Gradu pri Krnu (*sl. 5–9*).

Čeladi iz Ljubljanice (*sl. 1; 2; t. 1*) in s Kovačevš (*sl. 3; t. 2*) sodita med tipološko starejše etruščansko-italske čelade. Pernet jih (brez argumentov, saj ni primerkov, ki bi izvirali iz zanesljivo datiranih najdiščnih okoliščin) datira v 4. in 3. st. pr. Kr.[56] Po Quesadi Sanz in Kavanagh de Prado so podobne čelade na Iberskem polotoku na najdiščih s konca 3. in začetka 2. st. pr. Kr., vendar te trditve nista utemeljila.[57]

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[50] Rezultati analiz: spodnja pločevina: Fe 0,68 %, Ni –, Cu 83,7 %, Zn –, As 0,29 %, Ag –, Sn 15,3 %, Sb –, Pb 0,07 %, Mn –; zgornja pločevina: Fe 0,53 %, Ni –, Cu 87,7 %, Zn –, As 0,22 %, Ag –, Sn 11,4 %, Sb –, Pb 0,11 %, Mn –. Razlika v izmerjenih odstotkih kositra verjetno izvira iz ostankov patine na merjenem mestu na spodnji pločevini.

[51] Prim. Degen 1978, 171–175; von Detten, Schalles, Schreiter 1993, 185–187, Mil 7–9, t. 24–25; Junkelmann, Thüry 2000, AG 331, 164–165, sl. 90.

[52] Prim. medeninasta lična ščitnika z železnimi zakovicami čelad tipa Weisenau: Junkelmann, Thüry 2000, 165–166, kat. AG 546 in AG 547, sl. 97.

[53] Ime vrha (Strmca, 542 m n. m.) sem povzela po geografskih kartah, v arheološki literaturi so ga doslej imenovali z ledinskim imenom Štirnca (npr. Slapšak 1974; Osmuk 2000–2004, 156–157; Osmuk 1976, 70–72). Neposredno zahodno od njega leži Tabor (kota 525,3 m n. m.). Strmca in Tabor imata vsak svoje prazgodovinsko obzidje, med seboj pa sta povezana z zidovoma, ki tečeta čez sedlo med njima. Vzhodno ob Strmci je še en vrh z obzidjem, ki je prislonjeno na obzidje gradišča na Strmci (opis topografske situacije: Slapšak 1974). Na spletnem lidarskem posnetku povezovalnega obzidja med Strmco in Taborom ni videti.

Z detektorjem kovin so na Strmci poleg zaključka čelade našli: žebljiček rimskega vojaškega obuvala z značilnim reliefom na spodnji strani (Narodni muzej Slovenije, inv. št. R 27127), ki kaže na datacijo v obdobje od Cezarjevih galskih vojn do okrog 20 pr. Kr. (prim. Istenič 2015a, 57–58), in poznorimsko pasno spono z okovom (Narodni muzej Slovenije, akc. št. 2013/4-3) ter po podatkih najditeljev dva avgustejska asa in 17 novcev iz 3. in 4. stoletja, od tega tri Gordijanove.

Ime Tabor so v literaturi uporabljali tudi kot skupno ime za vse tri vrhove južno od Povirja (Petru 1975; Osmuk (1974, 68–69; Osmuk 1976, 70–72). Zato (in pa zaradi skopih najdiščnih podatkov) za predmete z najdišča "Tabor pri Povirju", ki jih hrani Narodni muzej Slovenije (inv. št. P 19542–P 19551, P 27237, R 18608–R 18610, R 26244–R 26246, R 26394–R 26395) ne vemo, s katerega izmed treh med seboj povezanih gradišč izvirajo. To so predmeti mlajše halštatske (med drugim odlomek negovske čelade), zgodnjerimske (žebljiček rimskega vojaškega obuvala z značilnim reliefom na spodnji strani, zvonec z valjastim plaščem in šestkotnim ročajem) in poznorimske dobe. Enako velja za Tiberijev in Klavdijev as (*FMRSl* I 51-2; *FMRSl* VI 35-1) ter poznorimske novce (*FMRSl* VI 35-4,5,6).

S Tabora pa zanesljivo izvirajo štirje žebljički rimskih vojaških obuval z značilnim reliefom na spodnji strani (Narodni muzej Slovenije, akc. št. 2018/17_1) iz obdobja med Cezarjevimi galskimi vojnami in 20 pr. Kr. (prim. Istenič 2015a, 57–58).

[54] Rezultati analize osnovne zlitine: Fe 0,015 %, Ni 0,11 %, Cu 64,4 %, Zn 0,38 %, As 0,95 %, Ag 0,24 %, Sn 6,96 %, Sb 0,66 %, Pb 26,3 %, Mn –.

[55] Elementna sestava ostankov spajkanja, meritev na patini: Fe 3,43 %, Ni 0,17 %, Cu 43,1 %, Zn 0,63 %, As 1,78 %, Ag 0,64 %, Sn 17,7 %, Sb 1,10 %, Pb 31,4 %, Mn –; meritev na ostankih spajkanja brez patine: Fe 0,12 %, Ni 0,13 %, Cu 72,4 %, Zn 0,45 %, As 0,66 %, Ag 0,19 %, Sn 5,05 %, Sb 0,44 %, Pb 20,6 %, Mn –.

[56] Pernet 2010, 73–74, sl. 37.

[57] Quesada Sanz, Kavanagh de Prado 2006, 70–72, sl. 2.

Najmlajše najdiščne okoliščine z etruščansko-italsko čelado so ostanki (v uvodu omenjene) ladje, ki se je ok. 70 pr. Kr. potopila pri Madrague de Giens (Francija).[58]

Junkelmann je etruščansko-italske čelade imenoval tip Montefortino in jih razdelil v pet podtipov.[59] Čeladi iz Ljubljanice in s Kovačevš ustrezata njegovemu podtipu Montefortino/Cremona.[60] Imenovan je po čeladi z latinskim napisom z najdišča Pizzighettone blizu Cremone, ki je – glede na napis – verjetno iz druge polovice 3. st. pr. Kr.[61] Na spodnjo stran vratnega ščitnika ene od čelad tega podtipa je z zakovico iz bakrove zlitine prikovičen bronast okov z dvema zankama, v katerih sta bronasta obročka;[62] tak okov se je ohranil tudi na čeladi podtipa Montefortino/Canosa.[63] Junkelmann meni, da sta bila v obročka vdeta jermena, ki sta vodila do zanke na spodnjem delu notranje strani ličnih ščitnikov in naprej pod brado, kjer sta bila zavezana.[64] Pri mlajših čeladah etruščansko-italske tradicije (tip Haguenau) je bil na istem mestu na spodnjo stran vratnega ščitnika prikovan okov z obročkom za obešanje čelade.[65]

Za čeladi iz Ljubljanice in s Kovačevš torej domnevamo datacijo od 3. do prve tretjine 1. st. pr. Kr.

Punciran okras valovitih vitic na vratnem ščitniku čelado, za katero domnevamo, da izvira iz okolice Sv. Antona[66] (*sl. 4*), in čelado z Gradu pri Krnu (*sl. 5–8*) uvršča med mlajše etruščansko-italske čelade, datirane v 2. in začetek 1. st. pr. Kr. Največ takih čelad so našli v Italiji, južni Franciji in Španiji, sicer pa najdišča segajo od Španije do Grčije in južne Rusije ter vključujejo grobove pokojnikov, ki niso pripadali Rimljanom. Čelade, namenjene poznorepublikanski rimski vojski, so torej našle pot tudi do bojevnikov drugih ljudstev,[67] pri katerih so veljale za pokazatelja visokega socialnega položaja njihovih lastnikov.[68]

Junkelmann je čelade z okrasom valovitih vitic in podobne čelade z drugačnim okrasom uvrstil v podtip Montefortino/Rieti ter, podobno kot Schaaff, datiral v 2. st. in začetek 1. st. pr. Kr.[69]

Čeladi z Gradu pri Krnu je zelo podobna čelada z odlično ohranjenim okrasom iz okolice Rietija (Italija) s pečatom Q. Cossius.[70] Povezujejo ju (kolikor je mogoče sklepati iz objavljenih fotografij) po tehniki izdelave in motivu izredno podoben punciran okras simetričnih valovitih vitic (sestavljenih iz punciranih linij in drobnih pikic) na vratnem ščitniku (*sl. 17*) ter puncirane rahlo usločene in simetrično ležeče linije, ki oblikujejo motiv smrekove vejice brez sredinske vodoravne linije, na spodnjem delu kalote.

Na ozko povezavo mlajših etruščansko-italskih čelad z rimsko vojsko oz. vojsko njenih italskih zaveznikov kaže njihova razširjenost,[71] na njihovo rimsko izdelavo pa pečat na omenjeni čeladi iz Rietija. Najstarejša zanesljivo rimska čelada je že omenjena čelada iz okolice Cremone z latinskim napisom, pri katerem oblika črk in navedeno ime govorita za datacijo v drugo polovico 3. st. pr. Kr.[72] Rimska vojska je v prvi četrtini oz. tretjini 1. st. pr. Kr. še uporabljala take čelade.[73]

Ostale rimske bronaste čelade iz Slovenije, ki izhajajo iz republikanskih čelad etruščansko-italske tradicije, sodijo v čas principata.

Čelada iz Ljubljanice (*sl. 10–12; t. 4*) sodi na prehod med tipoma Buggenum in Haguenau.[74] S tipološko starejšim tipom Buggenum jo povezujeta odsotnost čelnega ščitnika in votel, v enem kosu s kaloto narejen gumb na vrhu čelade.[75] Na mlajši tip čelad, poimenovan po najdišču Haguenau v Alzaciji (nem. Hagenau; Francija), pri katerem je med drugim običajen posebej izdelan gumb na vrhu čelade, kažejo nastavki za pritrditev okrasa ob straneh in na zadnji strani čelade.[76] Enako velja za

[58] Feugère 1994a, 39–40.

[59] Podtipi: Talamone, Canosa, Cremona, Rieti in Buggenum. V skupino etruščansko-italskih čelad je torej vključil tudi čelade tipa Buggenum (Junkelmann 2000, 52–65).

[60] Junkelmann 2000, 59–60; Junkelmann, Thüry 2000, 100, 107–110; t. 4; sl. 30–34; kat. AG 130; AG 290.

[61] Junkelmann 2000, 60, sl. 10, 11.

[62] Junkelmann, Thüry 2000, 100, 109–110; t. 4; sl. 33, 34; kat. AG 290.

[63] Junkelmann, Thüry 2000, 93–94, sl. 26; kat. AG 441.

[64] Junkelmann 2000, 59; Junkelmann, Thüry 2000, 94, 96, 110.

[65] Prim. čelade iz Ljubljanice (št. 5), Mušje jame (št. 6) in Save pri Mokricah (št. 7) ter op. 126.

[66] Reinecke 1942, 190, op. 132; Egg et al. 1988, kat. 109.

[67] Schaaff 1988, 319–322, sl. 3; Egg et al. 1988, kat. 111; Pernet 2010, 74, sl. 38.

[68] Feugère 1994a, 39–40.

[69] Junkelmann 2000, 53, 60–62; Junkelmann, Thüry 2000, 110–115; sl. 35–41; kat. AG 597, AG 266, AG 310.

[70] Junkelmann 2000, 61, sl. 13; Schaaff 1988, 321, sl. 5.

[71] Schaaff 1988, sl. 3; Pernet 2010, 74, 75, sl. 38.

[72] Junkelmann 2000, 60, sl. 10, 11.

[73] Feugère 1994a, 39–40; Pernet 2010, 75.

[74] Schaaff 1988; Waurick 1988; Waurick 1990, 12–13, 20–30, sl. 22, sl. 7, 12, 13, 16–19, 22, t. 1: 2; Ortisi 2015, 27, 28.

[75] Prim. Schaaff 1988, 325–326.

[76] Ortisi 2015, 27; Waurick 1988, 327–333; čelade tipa Haguenau z (deloma) ohranjenimi nastavki za okras: von

punciran napis na vratnem ščitniku, ki se nanaša na lastnika čelade in enoto, v kateri je deloval. Daleč največ čelad z napisi namreč pripada temu tipu,[77] pri tipu Buggenum so redki.[78]

Podobni čeladi, ki sta po tipoloških merilih med tipoma Buggenum in Haguenau, izvirata iz Neussa[79] in neznanega najdišča.[80] Tako kot čelada iz Ljubljanice sta bili skupaj z gumbom narejeni v enem kosu in nimata čelnega ščitnika, sicer pa ustrezata tipu Haguenau. Čelada z neznanega najdišča ima na spodnji strani vratnega ščitnika punciran napis.

Luknja na vratnem ščitniku (*sl. 11e,f*) kaže, kje je zakovica na spodnjo stran ščitnika prikovala okov z obročkom, verjetno namenjen obešanju čelade.[81]

Čelade tipa Buggenum so se verjetno razvile v sredini 1. st. pr. Kr.,[82] njihova razširjenost ob spodnjem Renu pa govori za uporabo v srednji (in pozni) avgustejski dobi, ko je bila povečana rimska vojaška dejavnost na tem območju. Kmalu po tem so jih zamenjale čelade tipa Haguenau.[83]

Najstarejša čelada tipa Haguenau iz ozko časovno opredeljenih najdiščnih okoliščin izvira iz Halterna in ima vse lastnosti tega tipa, vključno s čelnim ščitnikom.[84] Od avgustejske do (zgodnje) flavijske dobe, ko se je uporaba čelad tipa Haguenau končala, so vratni ščitniki postajali daljši in širši.[85]

Poševen in kratek vratni ščitnik čelade (*sl. 11b–f*) je le malo širši od kalote in je podoben vratnemu ščitniku čelade iz Halterna.

Po tipoloških kriterijih se torej za čelado iz Ljubljanice zdi verjetna datacija v zaključno obdobje uporabe čelad tipa Buggenum in na začetek uporabe čelad tipa Haguenau, tj. v srednjo ali pozno avgustejsko dobo.

Iz napisa *P(ublii) Oppi(i) >(centuria) Cracci* na čeladi (*sl. 12; t. 4*) izhaja, da je bila last vojaka z imenom Publius Oppius iz centurije, ki ji je poveljeval mož s kognomnom Graccus ali (dosti manj verjetno) Craccus.[86] Lastnik čelade je podan z osebnim imenom (*praenomen*) in rodovnim/družinskim imenom (*nomen/gentilicium*), kar jasno kaže, da gre za rimskega državljana in datacijo pred koncem prve polovice 1. st.[87] *Oppius* je latinsko ime[88] in je z največ primerki zastopano v Italiji,[89] zato domnevam, da je bil lastnik čelade doma v Italiji.

Za opredelitev čelade iz Mušje jame pri Škocjanu (*sl. 13; t. 5*) v tip Haguenau sta odločilni luknjici na sprednjem delu čelade – kažeta, da je bil tam z zakovicama pripet čelni ščitnik (se ni ohranil) – in oblika gumba z navpično zarezo v sredini.[90] Tipološke značilnosti (oblika in nagib vratnega ščitnika) in tehnika izdelave gumba (narejen v enem kosu s kaloto) nakazujejo zgodnjo datacijo,[91] vendar – glede na primerjavo s čelado iz Halterna – po avgustejski dobi. Neobičajni sta luknjici na vratnem ščitniku; ni jasno, čemu sta služili.

Napisa *>(centuria) Caesidieni C(aius) Tomius* in *>(centuria) Postumi M(arci) Valeri Bacini*[92] (prevod: iz Kajsidienove centurije, (lastnik) Gaj Tomij[93] / iz Postumove centurije, (čelada) Marka Valerija Bacina) na vratnem ščitniku (*sl. 13; t. 5*) se nanašata na (najverjetneje zaporedna) lastnika čelade.[94] Eden je bil Marcus Valerius Bacinus iz centurije, ki jo je vodil Postumus, ime drugega

Detten, Schalles, Schreiter 1993, 178–181, Mil 1, 2, t. 20, 21; Klein 2003, 30–32, sl. 3–5.

[77] Waurick 1988, 332–333.

[78] Schaaff 1988, 325–326.

[79] Waurick 1988, 328–329, sl. 1: 1.

[80] Junkelmann, Thüry 2000, 123; kat. AG 538.

[81] Prim. von Detten, Schalles, Schreiter 1993, 180–185, Mil 2–4, t. 21–23; Klein 2003, 31, sl. 4.

[82] Glavni element za datiranje njihovega začetka je čelada iz Kolpe pri Sisku z napisom SCIP IMP (Egg et al. 1988, 529, kat. 113; Waurick 1990, 12–13, 20–23, sl. 12, 13), ki nakazuje, da je njen lastnik služil pod poveljstvom P. Cornelia Scipia Nasice. Ta je dobil naziv imperator leta 49 pr. Kr. in je umrl leta 46 pr. Kr.

[83] Schaaff 1988, 325–326; Feugère 1994a, 47–49, 79–80; Schreiter 1993, 44; Ortisi 2015, 27.

[84] Müller 2002, 34–35, 181, št. 430, t. 39, 40.

[85] Waurick 1988, 329, 356; Feugère 1994a, 84–85; von Detten, Schalles, Schreiter 1993, 180.

[86] Precej manj verjetno se zdi, da je navedeno rodovno ime poveljnika centurije, to je Craccius oz. Graccius.

[87] Bodel 2001, 83–84.

[88] Solin, Salomies 1994, 132.

[89] *OPEL* III, 114; *EDCS* (ime je omenjeno na 268 napisih, od katerih jih skoraj polovica izvira iz Italije).

[90] V tip Haguenau in zgodnjecesarsko dobo je čelado uvrstil že Degrassi (1929). Vidulli-Torlova (2008, kat. 21) je čelado uvrstila v tip Buggenum. Enako jo je opredelila Maggijeva (Maggi 2005; 2016), ki jo je, tudi na podlagi napisov (po mojem mnenju nepravilno), datirala na konec republikanske dobe.

[91] Prim. Waurick 1988, 329, 332, 356, sl. 2; von Detten, Schalles, Schreiter 1993, 178–185, t. 20–23; Feugère 1994a, 81–86; Junkelmann 2000, 67–68.

[92] *CIL* I 3609 = *AE* 1930, 127 = *EDR*007414 = *EDCS*-26700425.

[93] Navedba lastnikovega imena v imenovalniku (ne v rodilniku) je na rimskih čeladah redka (npr. čelada iz Schaana: Degen 1978, 172–174).

[94] Puncirani lastniški napisi so na čeladah tipa Haguenau pogosti (Waurick 1988, 332–333), zato se ne morem strinjati s povezovanjem enega od napisov na čeladi iz Mušje jame z imenom božanstva (prim. Teržan 2016, 429.

pa je Gaius Tomius in je služil v centuriji, ki ji je poveljeval Caesidienus. Oba lastnika čelade sta bila rimska državljana. Tomius, Caesidienus in Postumus so latinska imena.[95] Caesidienus je izpričan le na obravnavanem napisu, Tomius je redko ime,[96] Postumus pa pogosto, predvsem v Italiji.[97] Bacinus je (razen na čeladi iz Mušje jame) izpričan le na enem napisu iz Hispanije.[98] Za lastnika čelade Gaja Tomija in oba poveljnika centurij (Postuma in Kajsidijena) domnevam, da so bili iz Italije.

Tipu Haguenau pripada tudi čelada z domnevnim najdiščem reka Sava pri Mokricah (*sl.14; t. 6*). Vratni ščitnik je razmeroma dolg in na straneh precej razširjen, kar (skupaj z odsotnostjo vrhnjega gumba) nakazuje mlajši primerek tipa Haguenau in datacijo v drugo četrtino 1. st.[99] Iz napisa *C(aii) Mati(i) c(o)ho(rtis) III >(centuria) P(ublii) Mussi(i) Tavri* (*sl. 14e; t. 6*) izhaja, da je bil lastnik čelade Gaj Matij (Gaius Matius) rimski državljan, torej je služil v legiji, s čimer se sklada omemba tretje kohorte.[100] Centuriji, ki ji je pripadal Gaj Matij, je poveljeval Publij Musij Taur (Publius Mussius Taurus).[101] Matius in Mussius sta latinski imeni,[102] najbolj razširjeni v Italiji,[103] zato domnevam, da sta bila lastnik čelade in njegov predpostavljeni iz Italije. Dejstvo, da je lastnik čelade zapisan z osebnim (*praenomen*) in družinskim/rodovnim imenom (*nomen/gentilicium*) brez kognomna (*cognomen*), nakazuje, da čelada ni mlajša od konca prve polovice 1. st.[104]

Gumbi čelad z najdišča Ljubljana – Šumi (*sl. 15:* 8–10; *t. 7:* 8–10) imajo po obliki dobre primerjave med čeladami tipov Buggenum oziroma Haguenau. Narejeni so v enem kosu s kaloto, kar je značilno za čelade tipa Buggenum in zgodnje primerke čelad tipa Haguenau, pri katerih sicer prevladujejo posebej izdelani in nato na kaloto pritrjeni gumbi.[105] Oblika (prisekanega) stožca dveh gumbov kljub temu nakazuje, da sta pripadala čeladama tipa Haguenau (*sl. 15:* 9,10; *t. 7:* 9,10),[106] izbočena oblika enega gumba pa govori za čelado tipa Buggenum (*sl. 15:* 8; *t. 7:* 8).[107] Čeladama tipa Haguenau sta prav tako pripadala gumba s stožčastim zgornjim delom z najdišč Ljubljana – Tribuna (*sl. 16*) in Strmca pri Povirju (*sl. 15:* 13; *t. 7:* 13), ki sta bila narejena posebej in na kaloto prispajkana. Gumb čelade z najdišča Ljubljana – Tribuna izvira iz ozko datiranih najdiščnih okoliščin (starejši tabor, datacija: po letu 10 pr. Kr.–začetek poznoavgustejske dobe),[108] ki kažejo, da so čelade s prispajkanimi gumbi izdelovali že v najstarejšem obdobju čelad tipa Haguenau.

Pripadnost ličnega ščitnika čelade (*sl. 15:* 12; *t. 7:* 12) iz mlajšega vojaškega tabora (datacija: od okoli leta 5 do konca poznoavgustejske ali začetka tiberijske dobe) v Ljubljani (najdišče Ljubljana – Tribuna) ni jasna. Zelo podoben mu je pokositren lični ščitnik iz bakrove zlitine, ki je bil najden v Gamli (Izrael) in je verjetno del opreme legionarja iz leta 67 po Kr. Ima podobno profiliran rob in luknjice ob njem. V levi zgornji luknjici je ohranjena velika glava zakovice. V objavi ta ščitnik povezujejo s čelado tipa Haguenau.[109]

Na čeladah tipa Haguenau so lični ščitniki ohranjeni le na dveh čeladah iz Schaana (Liechtenstein).[110] Lični ščitniki teh čelad so enake osnovne oblike kot lični ščitnik iz Ljubljane (brez izreza za uho), vendar enostavnejši, ravni (brez reliefno dvignjenih oziroma nižjih pasov ob robovih).

Podobno profilacijo robov kot ščitnik iz Ljubljane imajo ščitniki čelad tipa Weisenau, ki so redko iz bakrove zlitine (običajno so železni) in imajo praviloma izrez za uho; izjema so lični ščitniki brez takega izreza na zgodnji različici čelad tipa Weisenau (podtip Weisenau/Nijmegen po Junkelmannu), ki so iz bakrove zlitine in na površini pokositreni.[111] Na spodnjem delu ličnih ščitnikov čelad iz Schaana je po ena zakovica z

[95] Solin, Salomies 1994, 40, 143, 189.

[96] V *EDCS* je en napis s tem imenom (*EDCS*-33100117).

[97] V *EDCS* je 278 napisov, polovica iz Italije, *OPEL* III, 155.

[98] *OPEL* I, 107 (Baccinus).

[99] Prim. opombo št. 85.

[100] Prim. Waurick 1988, 332.

[101] Hoffiler 1937, 31, 32. Centurija (P. Mussia) Taura je omenjena še na dveh čeladah, iz Save pri Zagrebu in iz Mezije Inferior (Mac Mullen 1960, 33, št. 6–8; napačno povezuje s 3. konjeniško kohorto – prim. Waurick 1988, 332).

[102] Solin, Salomies 1994, 115, 124.

[103] Matius: v bazi *EDCS* je 126 napisov (več kot polovica iz Italije); Mussius: 41 napisov (polovica iz Italije).

[104] Bodel 2001, 83–84.

[105] Prim. zgoraj, to poglavje; Schaaff 1988, 325; Waurick 1988, 327.

[106] Waurick 1988, 327–328, 331–332; sl. 1: 1,2,4; 1A; 1B; 2: 1,3.

[107] Schaaff 1988, 325.

[108] Prim. op. 45.

[109] Stiebel 2014, 58–62, sl. 4.2: 1.

[110] Degen 1978, 171–176; Waurick 1988, sl. 1: 3.

[111] Waurick 1988, 333–335, sl. 3: 1; Junkelmann 2000, 78, kat. št. AG 292; Junkelmann, Thüry 2000, 124, 125, 129, 164, 165, kat. št. AG 292, AG 331. Brez ušesnega izreza sta tudi lična ščitnika na čeladi podtipa Weisenau/

izrazito glavo na njihovi zunanji strani,[112] ki je najverjetneje služila pritrditvi (usnjenega) jermena, namenjenega povezavi obeh ščitnikov. Enako funkcijo je najverjetneje imela (slabo ohranjena) zanka na notranji strani ličnega ščitnika iz Ljubljane, ki ima odlične primerjave na treh ličnih ščitnikih iz bakrove zlitine iz Rena pri Xantnu (v zankah so ohranjeni obročki), ki so najverjetneje pripadali čeladam tipa Haguenau, podobne pa so ji tudi slabše ohranjene zanke na ličnih ščitnikih, ki so najverjetneje deli čelad tipa Weisenau z istega najdišča.[113] Lični ščitnik iz Ljubljane je bil torej verjetno del čelade tipa Haguenau ali zgodnje različice čelade tipa Weisenau.

MATERIALI IN NAČIN IZDELAVE

Vse etruščansko-italske čelade iz Slovenije so narejene v enem kosu, skupaj z gumbom na vrhu. Sledovi izdelave kažejo, da so jih skovali in na zunanji površini spolirali ter okrasili s tehniko punciranja.

Poznamo približno elementno sestavo čelade iz Ljubljanice in čelade z Gradu pri Krnu. Obe sta iz brona, ki poleg bakra vsebuje 12 oziroma približno 6 % kositra, delež svinca pa je tako majhen, da je jasno, da ni bil namerno dodan. Taka zlitina je primerna za ulivanje in kovanje, tista z 12 % kositra je tudi optimalna glede trdote in žilavosti.[114]

Rezultati analiz elementne sestave čelad iz Slovenije se dobro ujemajo z izsledki analiz enajstih drugih etruščansko-italskih čelad (podtipi Montefortino/Talamone, Montefortino/Canosa in Montefortino/Cremona po Junkelmannu).[115] To nakazuje, da so čelade etruščansko-italskega tipa (običajno) delali iz brona, ki vsebuje srednje veliko kositra (6 do 11 ali 12 %) in nič (ali zelo malo) svinca ali drugih elementov. Taka zlitina je primerna za ulivanje in kovanje ter druge tehnike hladne obdelave.[116] Iz binarnih zlitin baker/kositer, z vsebnostjo kositra od 5–7% do 10-12%, so čelade iz pozne bronaste dobe.[117]

Do sedaj se je o tehniki izdelave čelad etruščansko-italskega tipa najjasneje izrekel Born. Menil je, da so jih delali na dva različna načina: tako, da so ulili gumb in material, iz katerega so nato s kovanjem oblikovali kaloto, oziroma tako, da so ulili gumb skupaj z že oblikovano kaloto. V obeh primerih so čelado dodelali s kovanjem in zunanjo površino polirali na počasi vrtečem se vretenu. Za okras pokončnih lokov na gumbu je menil, da je nastal ob vlivanju ali z graviranjem, za okras roba čelade pa, da je nastal s piljenjem.[118]

Iz izsledkov preučitve čelad s slovenskih najdišč nič ne kaže na to, da bi bili gumbi čelad uliti. Brez težav je bilo mogoče votle gumbe teh čelad narediti s kovanjem.[119]

Iz brona z okoli 10 oziroma 12 % kositra so čelada tipa Buggenum/Haguenau iz Ljubljanice in trije zgornji deli čelad tipov Buggenum oziroma Haguenau z najdišča Ljubljana – Šumi. Bron s takim odstotkom kositra je trd in žilav.[120] Gumbi teh čelad so bili narejeni v enem kosu s kaloto. Menim, da so bile čelade narejene s kovanjem in na zunanji površini spolirane na vretenu. Enako sta bili po mojem mnenju narejeni čeladi iz Mušje jame in Save pri Mokricah.

Za gumb čelade tipa Haguenau s Strmce pri Povirju, ki je bil ulit posebej, so uporabili svinčev bron in ga nato z zlitino kositra in svinca prispajkali na vrh čelade. Natančen pregled in opredelitev zlitin drugih gumbov čelad tipa Haguenau bosta pokazala, ali sta bili pri posebej narejenih gumbih uporaba svinčevega brona in tehnika ulivanja običajni. To bi se zdelo smiselno, saj je dodatek svinca zlitino pocenil, hkrati pa je bila taka zlitina primerna za ulit izdelek, za katerega posebne mehanske lastnosti (trdnost, žilavost), nujne za kaloto, niso bile potrebne.

Lični ščitnik z najdišča Ljubljana – Tribuna je bil skovan iz brona, ki vsebuje 8–9 % kositra, torej iz zlitine, primerne za hladno obdelavo,[121] kar se sklada z načinom izdelave.

Podatke o uporabljenih zlitinah pri čeladah tipa Haguenau s slovenskih najdišč lahko primerjam s čelado istega tipa iz Halterna, pri kateri je bil gumb izdelan v enem kosu s čelado, posebej narejen in

Guttman (Junkelmann 2000, 79, 80; Junkelmann, Thüry 2000, 140–141, kat. št. AG 600).

[112] Degen 1978, 171–175.

[113] Von Detten, Schalles, Schreiter 1993, 185–190; t. 24–27; Mil 7–12.

[114] Born 1991, 73, 77.

[115] Born 1991.

[116] Born 1991, 77 (delež svinca je manj kot 0,25 %, le v enem primeru 1,7 %).

[117] Trampuž Orel 2016, 333.

[118] Pri prvem primeru rentgenski posnetki kažejo le sledove kovanja, v drugem primeru sledove kovanja in ulivanja (Born 1991, 75–77, t. 12–14). Poliranje na počasi vrtečem se vretenu domneva tudi Junkelmann (2000, 54–55).

[119] Za mnenje se zahvaljujem Christophu Steidlu Porenti (prim. op. 30) in Tomažu Lazarju (Narodni muzej Slovenije).

[120] Brown 1976, 25.

[121] Brown 1976, 25.

dodan pa je bil čelni ščitnik. Čelni ščitnik je iz medenine (92,16% bakra in 7,63% cinka), sama čelada pa iz svinčevega brona z visokim deležem kositra (glavni zlitinski elementi so baker - 64,71%, kositer - 26,04% in svinec - 7,87%).[122] Taka zlitina je ugodna za ulivanje, a neprimerna za hladno oblikovanje.[123]

Elementna sestava drugih čelad tipa Buggenum ali Haguenau oziroma njihovih delov mi ni poznana.

V dosedanjih objavah tehnika izdelave čelad tipa Buggenum ni obravnavana, za čelade tipa Haguenau pa prevladuje mnenje, da so jih izdelovali s kovanjem (redko s predhodnim ulivanjem).[124] Potrebna bo poglobljena raziskava načina izdelave čelad tipov Buggenum in Haguenau, ki bo vključevala opredelitev zlitin.

Zalitje notranjosti gumba (verjetno z zlitino svinca in kositra), ki smo ga ugotovili pri čeladi tipa Buggenum/Haguenau iz Ljubljanice, sem zasledila pri redkih drugih rimskih bronastih čeladah republikanske dobe in principata.[125]

Zanke za pritrditev ličnih ščitnikov so pri obravnavanih bronastih čeladah iz brona (obe čeladi iz Ljubljanice in verjetno čelada iz Save pri Mokricah) ali železa (čelada z Gradu pri Krnu) in so skovane (obe čeladi iz Ljubljanice in čelada z Gradu pri Krnu) ali ulite (čelada iz Save pri Mokricah). Na kaloto so prikovane z zakovicami iz bakra (obe čeladi iz Ljubljanice), brona (?) (čelada iz Mušje jame), bakra ali bakrove zlitine (čelada iz Save pri Mokricah) ali železa (čelada z Gradu pri Krnu).

Ostanki zakovice v sredini vratnega ščitnika so se ohranili le pri čeladi iz Mušje jame in kažejo, da je bila železna. Iz primerjave s čeladami z drugih najdišč izhaja, da so zakovice na tem mestu običajno iz bakra ali bakrove zlitine in da so na spodnjo stran ščitnika pritrjevale zanko z obročkom.[126]

Na čeladah z drugih najdišč so zanke za pritrditev ličnih ščitnikov običajno iz bakrove zlitine in skovane, vendar so lahko – zdi se, da pri najmlajših čeladah – ulite.[127] Za zakovice v objavah ni navedeno, ali so bakrene ali bronaste. Železne zakovice so na etruščansko-italskih[128] in mlajših rimskih bronastih čeladah[129] redke, železnih zank za pritrditev ličnih ščitnikov v literaturi nisem našla. Zdi se, da so bakrene zakovice pri rimski vojaški opremi običajne.[130] Iz bakra je prav tako zakovica na ličnem ščitniku z najdišča Ljubljana – Tribuna.

Baker je zaradi žilavosti in plastičnosti zelo primeren za povezovalne elemente, kot so zakovice, na katere so delovale razmeroma velike sile. Podobno velja za kovno železo (oziroma nizkoogljično jeklo), pridobljeno iz volka, ki ga odlikujejo velika žilavost, duktilnost in nizka trdota, zaradi česar prenese visoko stopnjo plastične deformacije.[131]

Najstarejši elementi iz medenine (nastavki za perjanice) so med obravnavanimi primerki iz Slovenije na čeladi iz Ljubljanice, ki je tipološko na prehodu med tipoma Buggenum in Haguenau. Sicer se pojavijo na najmlajšem tipu rimskih čelad etruščansko-italske tradicije, tj. tipu Haguenau.[132] Medenino so Rimljani začeli izdelovati in uporabljati ok. leta 60 pr. Kr. in je pri rimski vojaški opremi od vključno avgustejske dobe dalje pogosta,[133] med drugim za okrasne elemente in nosilce perjanic železnih čelad tipa Weisenau.[134]

Z najmlajšimi čeladami etruščansko-italske tradicije je povezano tudi spajkanje. Z zlitino kositra in svinca so na kaloto pritrdili nastavke za perjanice (čelada št. 5 iz Ljubljanice) in vrhnji gumb, če je bil narejen posebej (gumb s Strmce pri Povirju). Uporaba zlitine kositra in svinca za spajkanje je bila pri rimski vojaški opremi običajna.[135]

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[122] Riederer 2002, 121, pregl. 19.

[123] Prim. zgoraj in Brown 1976, 25–26.

[124] Waurick 1988, 327–328. Glede na navedbe v objavi von Detten, Schalles, Schreiter 1993 (178–184, Mil 1–6) so bile čelade tipa Haguenau (šest primerkov) iz Rena pri Xantnu, ki so verjetno iz prve polovice/sredine 1. st., narejene le s kovanjem. Feugère (1994a, 84) meni, da so kombinirali ulivanje in hladno obdelavo.

[125] Junkelmann 2000, 55.

[126] Dobro ohranjene zanke z obročki so na čeladah iz Rena pri Xantnu (von Detten, Schalles, Schreiter 1993, 180–184, t. 22: Mil 2–6).

[127] Npr. tipološko pozne čelade podtipa Haguenau iz Xantna (Waurick 1988, 331, sl. 1B, desno spodaj).

[128] Npr. na dveh čeladah podtipa Monterfortino/Canosa (Junkelmann, Thüry 2000, 93, 96; AG 441, AG 542; sl. 28; t. 1).

[129] Železna zakovica je omenjena na vratnem ščitniku čelade tipa Haguenau iz Halterna (Müller 2002, 181, kat. 430).

[130] Istenič 2016, 279–281.

[131] Pleiner 2006, 16–20.

[132] Prim. tudi von Detten, Schalles, Schreiter 1993, 178–181, Mil 1, 2, t. 20, 21; Klein 2003, 30–32, sl. 3–5.

[133] Istenič 2005; Istenič, Šmit 2007; Istenič 2010; Istenič 2015b; Istenič 2016.

[134] Npr. Breščak 2015, gr. 1 in 41, t. 4–6, 14–16. Domnevam, da so obrobe, ki so v objavi navedene kot "bronaste", iz medenine. Medeninaste okrase (brez omembe naravoslovnih analiz) na železnih čeladah tipa Weisenau omenjata Junkelmann, Thüry 2000 (128–144, kat. AG 503, AG 501, AG 502, AG 600, AG 800). Prim. nosilec perjanice z najdišča Ljubljana – Tribuna (*sl. 19*).

[135] Istenič 2016, 279–281.

SKLEP

Rimskim bronastim čeladam poznorepublikanske in zgodnjecesarske dobe v Sloveniji (*sl. 18*) pripada šest čelad, številni odlomki ene čelade, trije odlomki (z gumbom) vrhnjega dela treh čelad, dva posebej narejena gumba (dveh čelad) in morda en lični ščitnik. Štiri čelade sodijo k čeladam etruščansko-italskega tipa, ki so jih nehali uporabljati v prvih desetletjih 1. st. pr. Kr. Skupaj z gumbom so narejene v enem kosu in na zunanji strani spolirane. Ostale čelade oziroma njihovi deli pripadajo tipoma Buggenum (vrh z gumbom ene čelade) in Haguenau (dve čeladi, dva gumba, dva odlomka z gumbom vrhnjega dela čelad) oziroma prehodu med omenjenima tipoma (ena čelada) in so iz zgodnjega principata. Lični ščitnik iz Ljubljane je pripadal čeladi tipa Haguenau ali Weisenau.

Razen ličnega ščitnika in vrhnjega dela čelade z najdišča Ljubljana – Tribuna ter treh vrhnjih delov čelad z najdišča Ljubljana – Šumi, pri katerih najdiščne okoliščine kažejo na datacijo v srednje- in poznoavgustejsko dobo oziroma v poznoavgustejsko-tiberijsko dobo, bronaste čelade iz Slovenije ne izvirajo iz najdiščnih okoliščin, ki bi jasno kazale na njihovo ožjo datacijo. Ta je torej mogoča le po tipoloških značilnostih. To je – zaradi pomanjkanja primerljivih čelad iz dobro datiranih najdiščnih okoliščin – najmanj zanesljivo za tipološko najstarejša primerka, tj. čelado iz Ljubljanice (kat. št. 1) in čelado s Kovačevš, zato sem ju časovno umestila v široko obdobje od 3. do prve tretjine 1. st. pr. Kr. Iz 2. st. ali prve tretjine 1. st. pr. Kr. sta verjetno čelada iz okolice Sv. Antona in čelada z Gradu pri Krnu, ki imata na vratnem ščitniku značilen punciran okras valovite vitice.

Tipološke značilnosti čelade iz Ljubljanice kažejo na datacijo v srednje- oziroma poznoavgustejsko dobo. Malo mlajša datacija (tiberijska doba) se zdi verjetna za čelado iz Mušje jame in za primerek, ki domnevno izvira iz Save pri Mokricah (tiberijsko-klavdijska doba). Gumb čelade s Strmce pri Povirju je pripadal čeladi tipa Haguenau, kar govori za datacijo od (pozno)avgustejske dobe do druge tretjine 1. st. po Kr.[136]

Od štirih čelad etruščansko-italskega tipa v Sloveniji dve – čelada s Kovačevš nad Vipavsko dolino in čelada z Gradu pri Krnu nad dolino Soče – izvirata iz najdiščnih okoliščin, ki ju povezujejo z drugimi najdbami.

Najdbe s Kovačevš, razen čelade, od orožja vključujejo prazgodovinski sulični osti in morda konici[137] ter del verižnega oklepa,[138] za katerega ni mogoče reči, ali je keltski ali rimski,[139] najdbe iz Krna pa ritualno deformirani mladohalštatski sekiri, zgornja dela dveh mečev iz obdobja LT D1 (eden z deli pripadajoče nožnice), štiri poznolatenske sekire in več suličnih osti.

Na obeh najdiščih močno prevladujejo najdbe, ki ustrezajo materialni kulturi prazgodovinskih prebivalcev od približno 5. do 1. st. pr. Kr. Med maloštevilnimi rimskimi predmeti s Kovačevš so najstarejše medeninaste fibule skupin Alezija[140] in Jezerine I[141] iz obdobja med ok. 60 in 15 pr. Kr.[142] Med poznanimi najdbami iz Krna sta rimska izdelka, poleg čelade, dve bronasti posodi, tj. vrček tipa Idrija (datacija: druga polovica/zadnja tretjina 2. st.–80/60 pr. Kr.[143]) in cilindrična posoda (datacija: 1. st. pr. Kr.[144]), medtem ko je bronasto vedro starejše (4.–3. st. pr. Kr.) in verjetno izvira iz predrimskega okolja vzhodnega dela severne Italije.[145]

Občasna prisotnost rimske vojske v Vipavski dolini v času neposredno pred ustanovitvijo kolonije v Akvileji leta 181 pr. Kr. in predvsem po njej je verjetna, saj je po dolini vodila glavna pot proti vzhodnemu zaledju Akvileje in ključnemu prelazu Razdrto/*Ocra*, ki so ga Rimljani osvojili v 2. st. pr. Kr.[146] Kljub temu se mi za čelado s Kovačevš, za katero je nakazana datacija od 3. do zgodnjega 1. st. pr. Kr., zdi verjetneje, da je zgodnji uvožen predmet (pridobljen npr. s trgovino ali kot

[136] Prim. op. 84 in 85.

[137] Svoljšak 1983, 25, št. 143, 145–147; t. 4: 111–114.

[138] Svoljšak 1983, 20, št. 44; t. 3: 91.

[139] Prim. Beck, Chew 1991, 34–35; Bishop, Coulston 2006, 63–64.

[140] Svoljšak 1983, 14, 20, št. 1, 2, 4, 136, t. 1: 12,17,24,25; Istenič 2005, 206–209, t. 1: 3,9,15,16 (fibula št. 3 je iz zlitine bakra, kositra in cinka).

[141] Svoljšak 1983, 19, št. 23, t. 1: 26; Istenič, Šmit 2007, 142, 144, 145, sl. 3 (leva fibula), pregl. 1: MNG inv. št. 24.

[142] Istenič 2005, 204–205; Istenič, Šmit 2007, 141–142, 145.

[143] Boube 1991, 25–32; Bolla, Castoldi 2016, 134, 150–151.

[144] Bolla, Boube, Guillaumet 1991, 7–11.

[145] Prim. Bolla, Castoldi 2016, 122–123; Turk et al. 2009c, 51–54, 57–59.

[146] Uvedba kontrole nad prelazom je povezana z rimskim vojaškim uničenjem prazgodovinskega naselja na Gradu pri Šmihelu, ki je nadzorovalo prelaz Razdrto. O koncu tega naselja v (verjetno sredini) 2. st. pr. Kr. priča številno tam najdeno rimsko orožje (Horvat 2002, 142, sl. 154–155); Horvat 2015, 276–267; Laharnar 2015, 11–14; Laharnar, Lozić 2016, 60–65). Ob koncu 2. ali na začetku 1. st. pr. Kr. so Rimljani na prelazu Razdrto zgradili trgovsko naselje (Horvat, Bavdek 2009, 93–96).

darilo), ki je v prazgodovinski skupnosti verjetno imel prestižno vrednost, kot da je neposredna sled prisotnosti rimske vojske.

Podobno menim za čelado iz Krna, ki je po tipoloških kriterijih mlajša (2. st.– prva tretjina 1. st. pr. Kr.). Občasno delovanje rimske vojske v 2. in 1. st. pr. Kr. v zgornji dolini Soče, ki je sodila v širše zaledje kolonije Akvileja in je bila rimskim trgovcem dobro poznana,[147] je verjetno, čeprav za zdaj manjkajo zanesljivi in ozko datirani arheološki viri.[148] Rimska čelada na najdišču z materialno kulturo, ki jo povezujemo s prazgodovinskim lokalnim prebivalstvom, a vključuje posamezne iz Italije uvožene predmete (kovinsko posodje), bi lahko bila predmet trgovine, prejeto darilo ali plen.

Za etruščansko-italsko čelado iz Ljubljanice nakazana datacija od 3. st. do začetka 1. st. pr. Kr. je glede na najdišče zgodnja. Najstarejši rimski predmeti iz Ljubljanice so namreč (razen čelade) bronasti vrček tipa Idrija[149] (druga polovica/zadnja tretjina 2. st.–80/60 pr. Kr.[150]) in rimski denar iz sredine 2. st. pr. Kr.,[151] najstarejše rimske vojaške najdbe pa so bistveno mlajše, iz začetka druge polovice 1. st. pr. Kr.[152] Neposredna rimska vojaška dejavnost v Ljubljanski kotlini se zdi v okviru poznanih geopolitičnih razmer v jugovzhodnih Alpah v 3. in na začetku 2. st. pr. Kr. malo verjetna,[153] za njeno kasnejšo dejavnost v času pred sredino 1. st. pr. Kr. pa doslej ni materialnih sledov. Vse to nakazuje interpretacijo etruščansko-italske čelade kot v prazgodovinsko skupnost uvožen predmet (trgovina ali darilo).

Pri čeladi iz okolice Sv. Antona slabo poznane najdiščne okoliščine in datacija v 2. st. ali začetek 1. st. pr. Kr., tj. v čas, ko je prisotnost rimske vojske v zaledju Akvileje pričakovana,[154] ne dajejo prednosti eni ali drugi interpretaciji (tj. čelada kot uvožen rimski predmet v domorodni skupnosti ali čelada kot sled rimske vojske).

Mlajše rimske bronaste čelade (oz. njihovi deli), ki so datirane od srednje- oziroma poznoavgustejske dobe do konca prve polovice 1. st. po Kr., kažejo na neposredno prisotnost rimskih vojakov na najdiščih. Za štiri gumbe in lični ščitnik takih čelad iz Ljubljane neposredna povezava z delovanjem rimske vojske med letom 10 pr. Kr. in prvimi leti po Kr. (najdbe, povezane z ostanki starejšega vojaškega tabora ne desnem bregu) ter v poznoavgustejsko-tiberijskem času (delovanje vojakov pri gradnji obzidanega mesta na levem bregu Ljubljanice) izhaja iz najdiščnih okoliščin[155] in se ujema z drugimi, z rimsko vojsko povezanimi najdbami srednjeavgustejske do tiberijske dobe, ki jasno kažejo, da je imelo območje Ljubljane pri rimskih vojaških osvajanjih Panonije v srednjeavgustejski dobi in med panonsko-delmatskim uporom (6–9 po Kr.) ter pri gradnji obzidanega mesta na levem bregu Ljubljanice pomembno vlogo.[156]

Gumb čelade s Strmce pri Povirju morda nakazuje prisotnost rimskih vojakov v obdobju od srednjeavgustejske do flavijske dobe. Okovni žebljiček s Strmce in štirje taki žebljički s sosednjega Tabora,[157] govorijo za (občasno) prisotnost rimskih vojakov že v obdobju med okrog 60 in 20 pr. Kr. Obe najdišči sta na vzpetinah (koti 542 in 525,3 m n. m.) ter sta omogočali nadzor prometnih poti, ki so vodile proti Trstu, severni Istri, Kvarnerju in prelazu Razdrto. Pri čeladah iz Ljubljanice, Mušje jame in Save povezavo z rimskimi vojaki jasno kažejo lastniški napisi. Iz napisov tudi izhaja, da so jih nosili rimski državljani, torej legionarji, za katere lahko v glavnem domnevam izvor v Italiji. To govori v prid že izraženi domnevi, da so bronaste čelade, ki izvirajo iz etruščansko-italskih čelad (tipa Buggenum oz. Haguenau), nosili vojaki, ki so bili rimski državljani in so bili predvsem italskega izvora ter so služili v legijah.[158]

Čelada tipa Buggenum/Haguenau iz Ljubljanice – skupaj z drugimi rimskimi vojaškimi najdbami – verjetno odseva intenzivne rimske vojaške transporte v srednji in pozni avgustejski dobi po Ljubljanici

[147] V svetišču na Gradiču nad Kobaridom so rimski darovi od vključno 2. st. pr. Kr. (Osmuk 1984, 232; Osmuk 1997; Osmuk 1998), iz bližine je tudi zakladna najdba rimskega in keltskega denarja iz druge polovice 2. st. pr. Kr. (Kos, Žbona Trkman 2009). Laharnar, Štular in Mlinar (2015) domnevajo, da so Rimljani na Gradiču v 2. st. zgradili utrjeno naselje, ki je delovalo kot trgovska postojanka.

[148] Za območje Kobarida z okolico glej Laharnar, Štular, Mlinar 2015, 252–253.

[149] Istenič 2009f.

[150] Glej op. 143.

[151] Miškec 2009.

[152] Istenič 2000a; Istenič 2000b; Istenič 2008.

[153] Najstarejše rimsko naselje na Vrhniki/*Nauportus* ob izviru Ljubljanice je iz konca 2. do prve polovice 1. st. pr. Kr. (P. Vojaković, I. Bekljanov Zidanšek in B. Toškan, članek v pripravi). Pregled rimskega osvajanja jugovzhodnih Alp: Horvat 2015 (s citirano lit.).

[154] Horvat 2015.

[155] Gaspari 2010, 88–99; Gaspari 2014, 131–133, sl. 139.

[156] Gaspari 2010, 88–99, 141–142; Vičič 2002; Gaspari 2014, 127–141; Gaspari et al. 2015.

[157] Prim. op. 53.

[158] Waurick 1988, 354–356; Schreiter 1993, 44.

in naprej po glavni prometnici (po kopnem in po reki Savi) proti severnemu Balkanu.[159] Močne rimske vojaške navzočnosti na tej poti na območju Brežiških vrat (med Krškim in Bregano), ki jo za obdobje med koncem 1. st. pr. Kr. in začetkom 1. st. po Kr. jasno kažejo ostanki vojaških taborov,[160] ne moremo povezati s čelado, ki po razpoložljivih podatkih izvira iz reke Save pri Mokricah. Proti temu govorijo njene tipološke značilnosti, ki kažejo na datacijo v tiberijsko-klavdijski čas.

Ostale rimske čelade avgustejske dobe in 1. st. po Kr. v Sloveniji pripadajo tipu Weisenau. Na čelade tega tipa, ki so bile v uporabi še v 2. stoletju, je vplivala keltska tradicija. Najpogosteje so železne ter okrašene z okovi iz bakrove zlitine (medenine), sicer pa so tudi iz bakrovih zlitin.[161] Značilne nosilce perjanice take čelade (iz železa ali bakrove zlitine) so našli v Kranju (železna)[162] in Ljubljani (lokacija Tribuna;[163] *sl. 19;* viš. 64 mm; teža 11,92 g; predmet je iz čiste medenine[164]), lični ščitnik iz bakrove zlitine na Panorami na Ptuju,[165] domnevni odlomki iz bakrove zlitine narejenih obrob takih čelad[166] pa so med najdbami iz poznovgustejske delavnice oziroma popravljalnice vojaške opreme v Ljubljani[167] in z najdišča Ljubljana – Šumi[168] ter iz Kranja.[169]

Cele čelade tipa Weisenau v Sloveniji izvirajo iz grobov, v katerih so bili verjetno pokopani vojaki pomožnih enot.[170] To govori v prid – med drugim na podlagi grobov iz Slovenije – že izraženi domnevi, da so bili s takimi čeladami opremljeni rimski vojaki v pomožnih enotah.[171] V zadnji tretjini 1. st. so čelade tipa Weisenau prevzeli tudi legionarji, čelade tipa Haguenau pa so prenehali uporabljati.[172]

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[159] Istenič 2009c; Istenič 2009d.

[160] Obrežje in drugi, bolj ali manj zanesljivo ugotovljeni tabori (Mason 2006; Mason 2008; Guštin 2015).

[161] Waurick 1988, 333–335; za datacijo začetkov tega tipa je pomemben srednje- oziroma poznoavgustejski grob iz Verduna (Breščak 2015, 79–80, gr. 1, t. 1–6).

[162] Sagadin 2015, t. 1: 4.

[163] Gaspari 2014, 138–141, sl. 139. O najdišču glej pri opisu najdbe (kat. št. 11 in 12). Nosilec perjanice (ARHEJ d.o.o., začasna št. P.N. 2052) je iz bakrove zlitine. Ni bil najden in situ (temveč na kupu izkopane zemlje), zato ga ni mogoče neposredno povezati z ostanki enega od obeh odkritih raziskanih taborov. Za najdiščne podatke se zahvaljujem Iris Bekljanov Zidanšek (ARHEJ, d. o. o.).

[164] Rezultati analize: Fe 0,31 %, Ni –, Cu 83,1 %, Zn 16,3 %, As –, Ag –, Sn 0,21 %, Sb –, Pb 0,11 %, Mn –.

[165] Horvat 2017. Prim. Junkelmann, Thurry 2000, 127–128, 131, 164–165; sl. 61–62, 91; t. 11, AG 502, AG 410.

[166] Odlomkov teh obrob (po risbah) ni lahko razlikovati od odlomkov okovov nožnic mečev tipa Mainz.

[167] Vičič 2002, 195, 196, 200, t. 12: 55–60; datacija: Horvat 2012, 280–281.

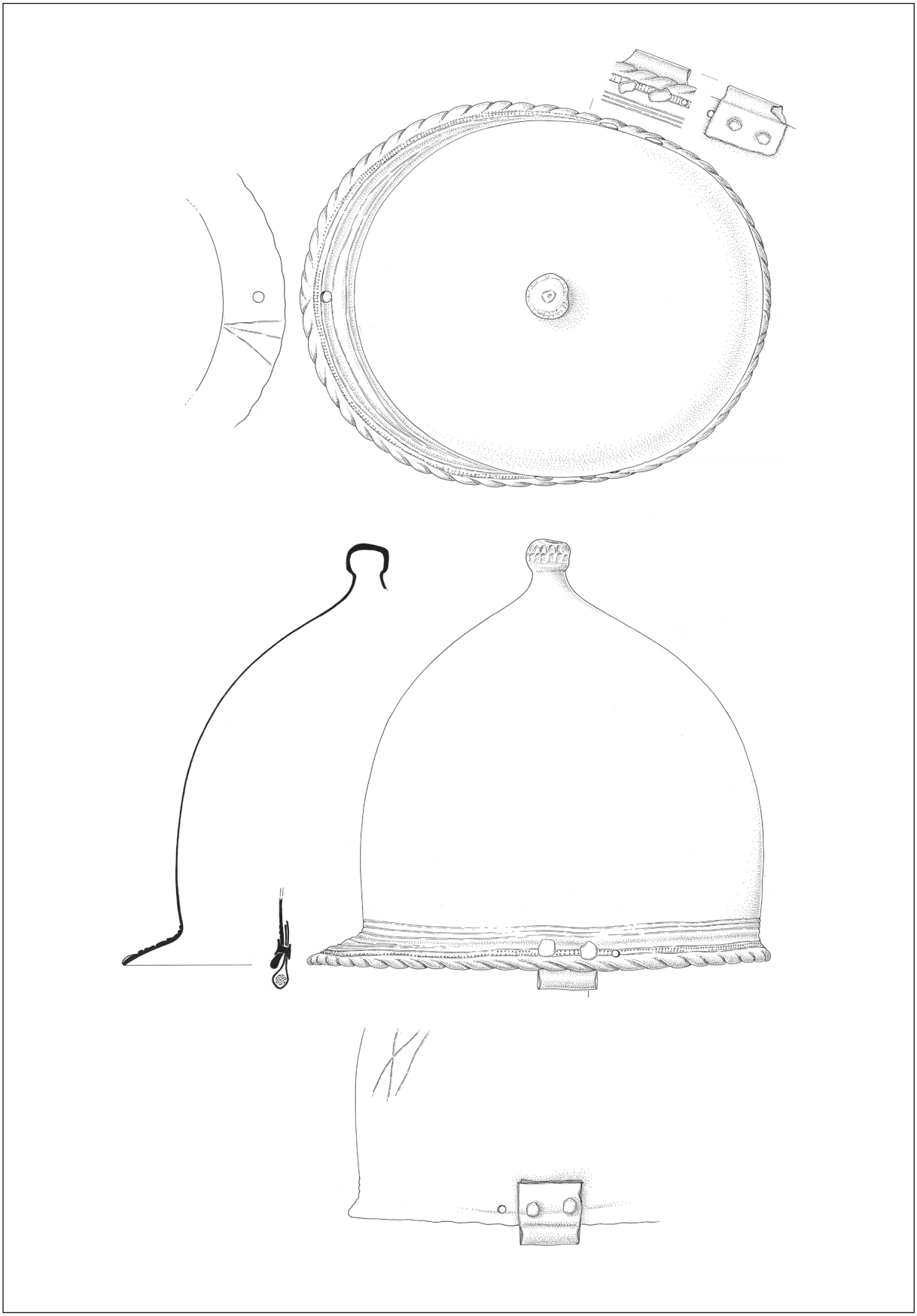
[168] Gaspari 2010, 90.

[169] Sagadin 2015, 215, t. 1: 2.

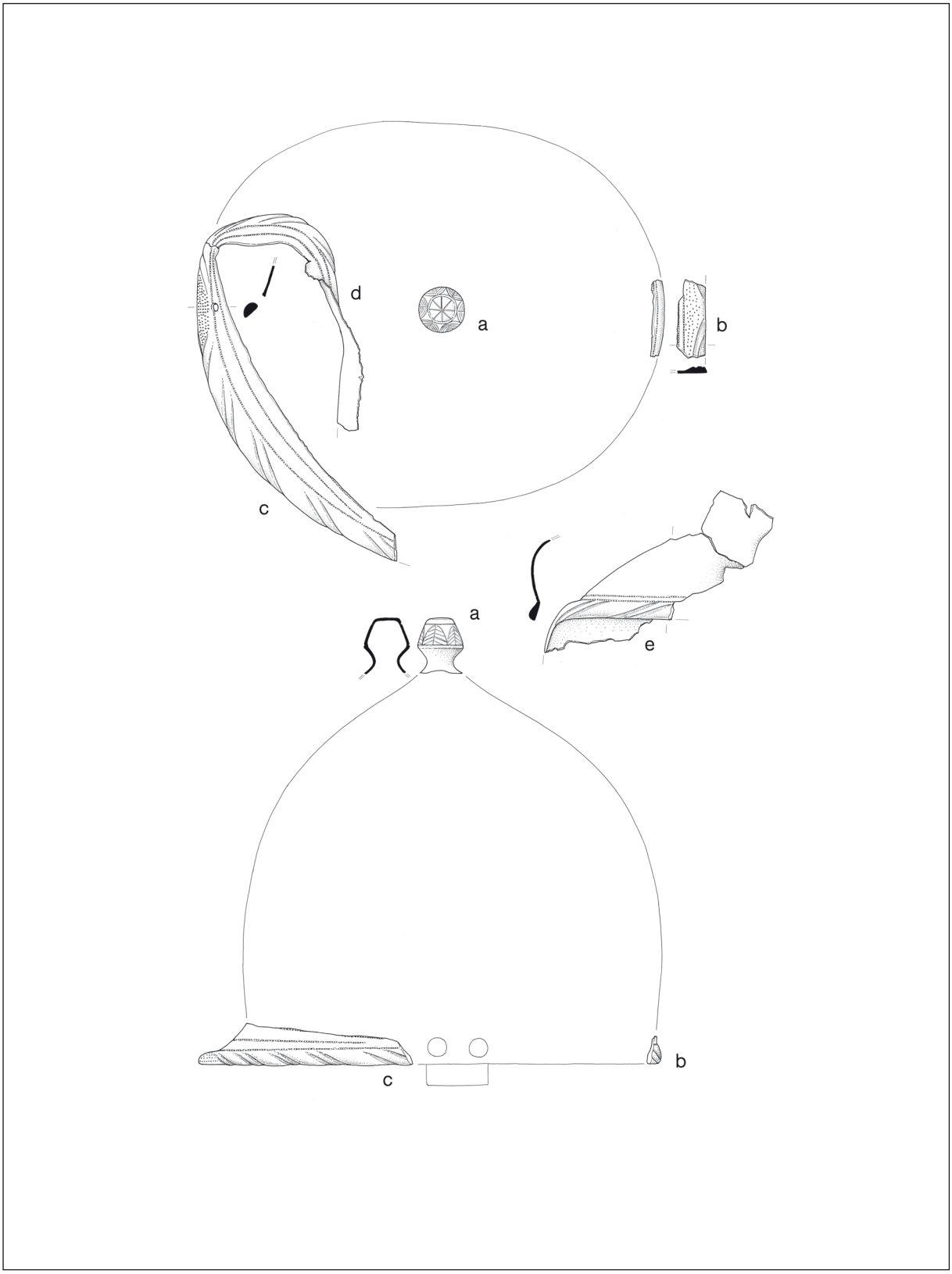
[170] Idrija pri Bači, gr. 16 (Guštin 1991, t. 16: 1); Verdun, gr. 1 in 41(Breščak 2015, t. 4–6, 14–15); interpretacija grobov z rimskim orožjem: Istenič 2013. Narodni muzej Slovenije hrani še eno čelado tega tipa, ki morda izvira iz Slovenije, vendar njeno najdišče ni znano.

[171] Waurick 1988, 353–356; morda so take čelade že pred flavijsko dobo nosili tudi legionarji (Junkelmann 2000, 74–82).

[172] Waurick 1988, 356; von Detten, Schalles, Schreiter 1993, 180; Schreiter 1993, 47.

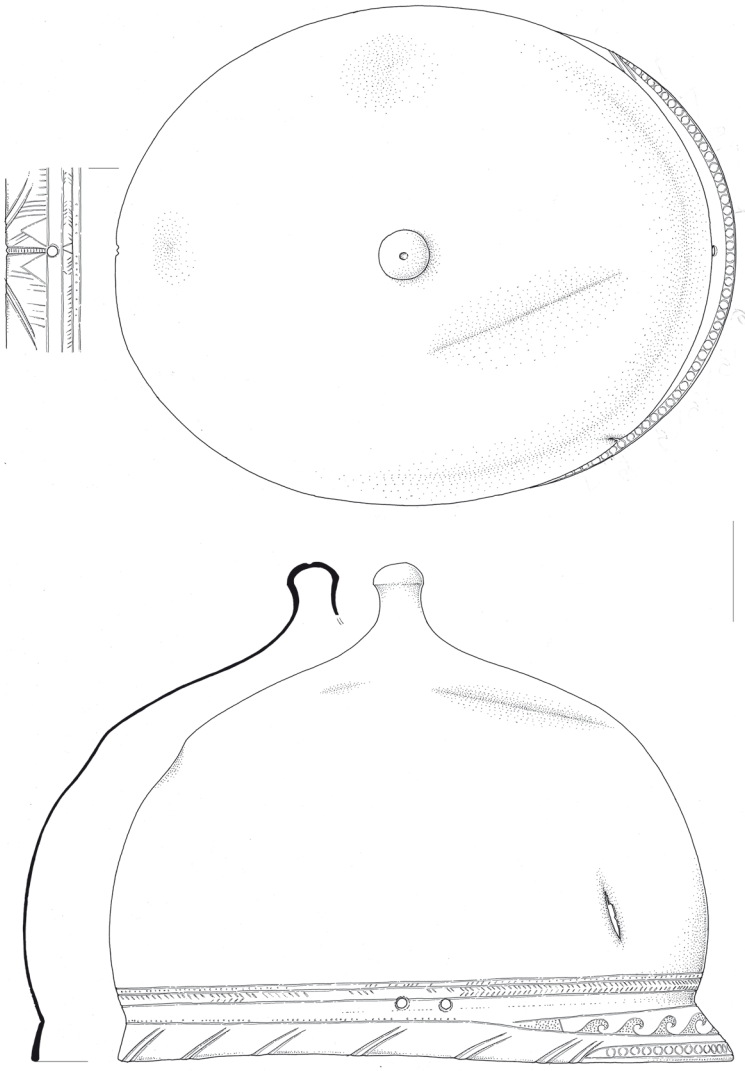


Pl. 1: River Ljubljanica at Blatna Brezovica (helmet Cat. No. **1**). Scale = 1:3.
T. 1: Reka Ljubljanica pri Blatni Brezovici (čelada kat. št. **1**). M. = 1:3.

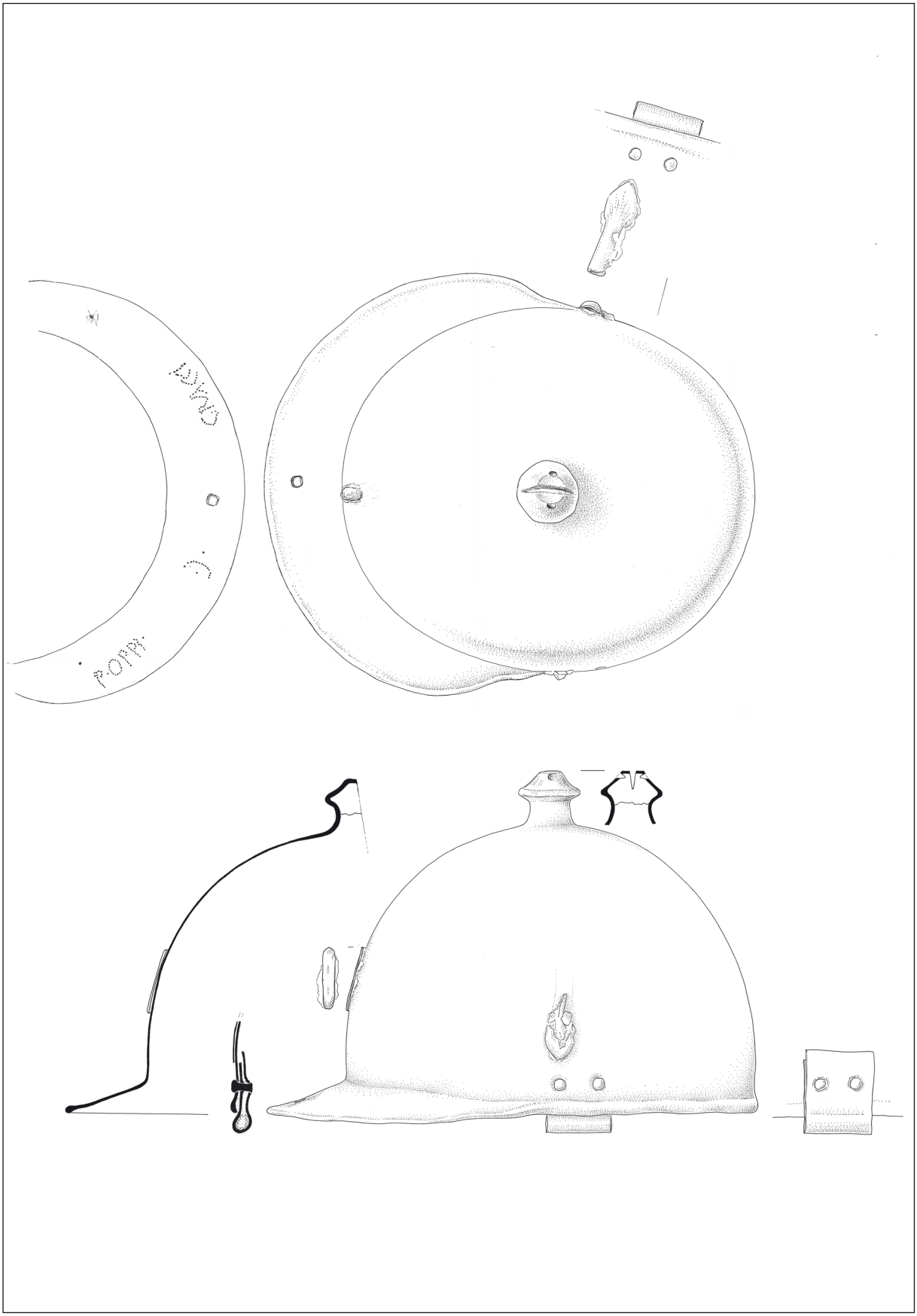


Pl. 2: Kovačevše in Lokavec (?). Bronze fragments identified as part of a helmet (Cat. No. **2**), shown in proper position **(a–d)** or as a separate fragment **(e)**. **a** – crest-knob; **b** – front rim fragment; **c**,**d** – neckguard fragments; **e** – heavily deformed rim and bowl fragment. Scale = 1:3.

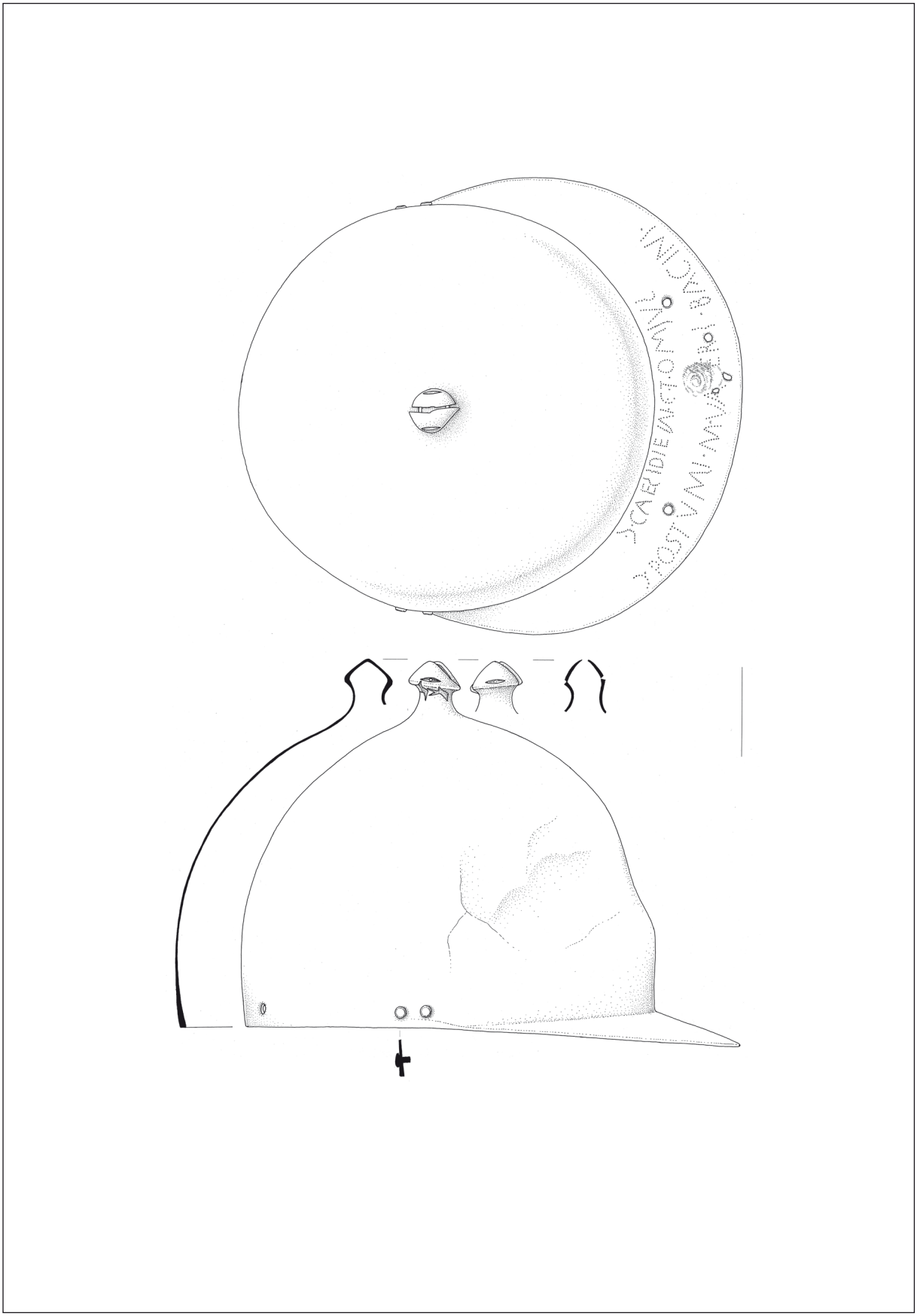
T. 2: Kovačevše v Lokavcu (?). Bronasti odlomki, zanesljivo deli čelade (kat. št. **2**), prikazani na rekonstrukciji **(a–d)** oz. kot odlomek **(e)**. **a** – vrhnji gumb; **b** – odlomek roba sprednje strani čelade; **c**,**d** – dela vratnega ščitnika; **e** – močno deformiran del roba in kalote. M. = 1:3.



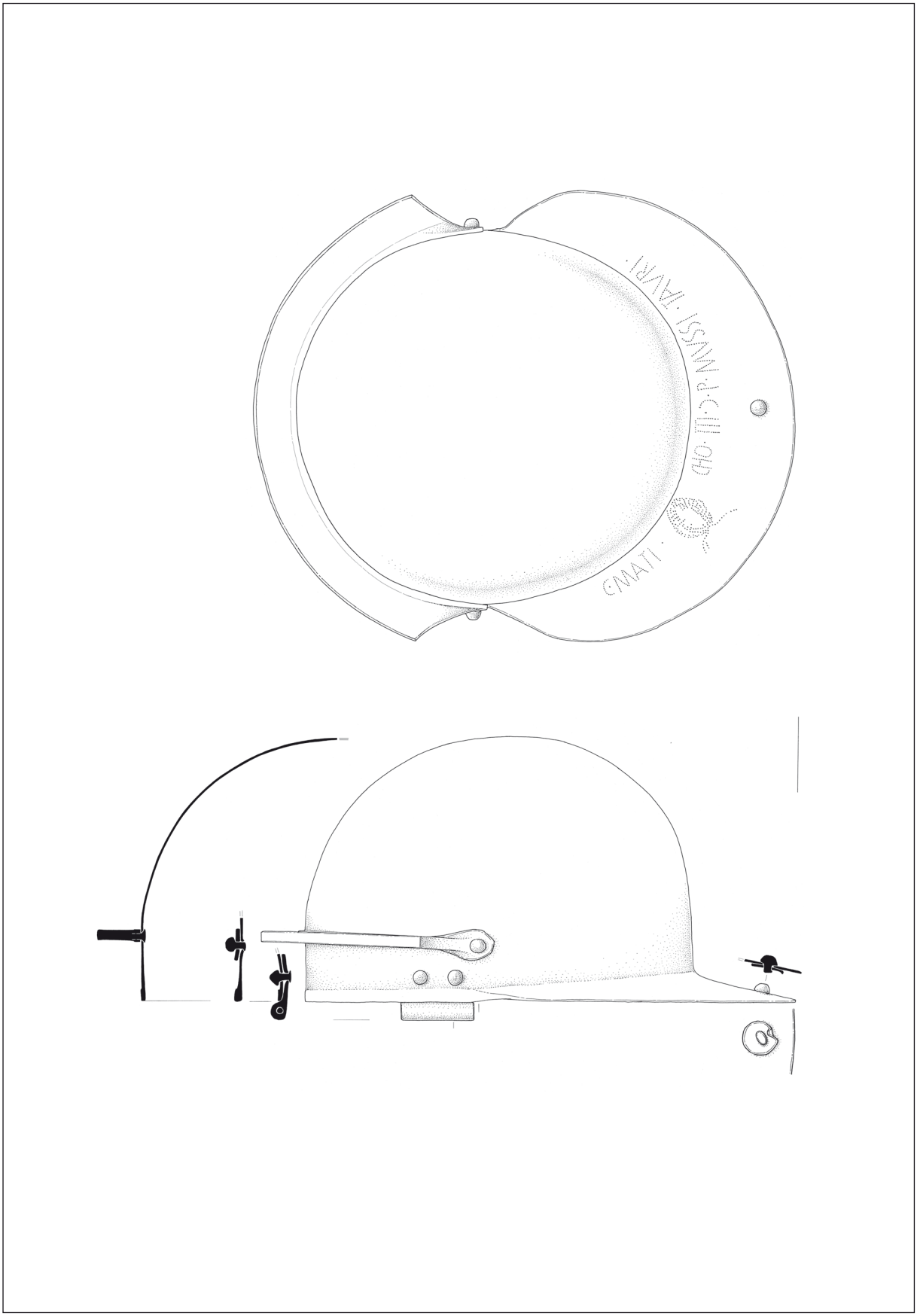
Pl. 3: Area of Sv. Anton (?) (helmet Cat. No. **3**). Scale = 1:3.
T. 3: Okolica Sv. Antona (?) (čelada kat. št. **3**). M. = 1:3.



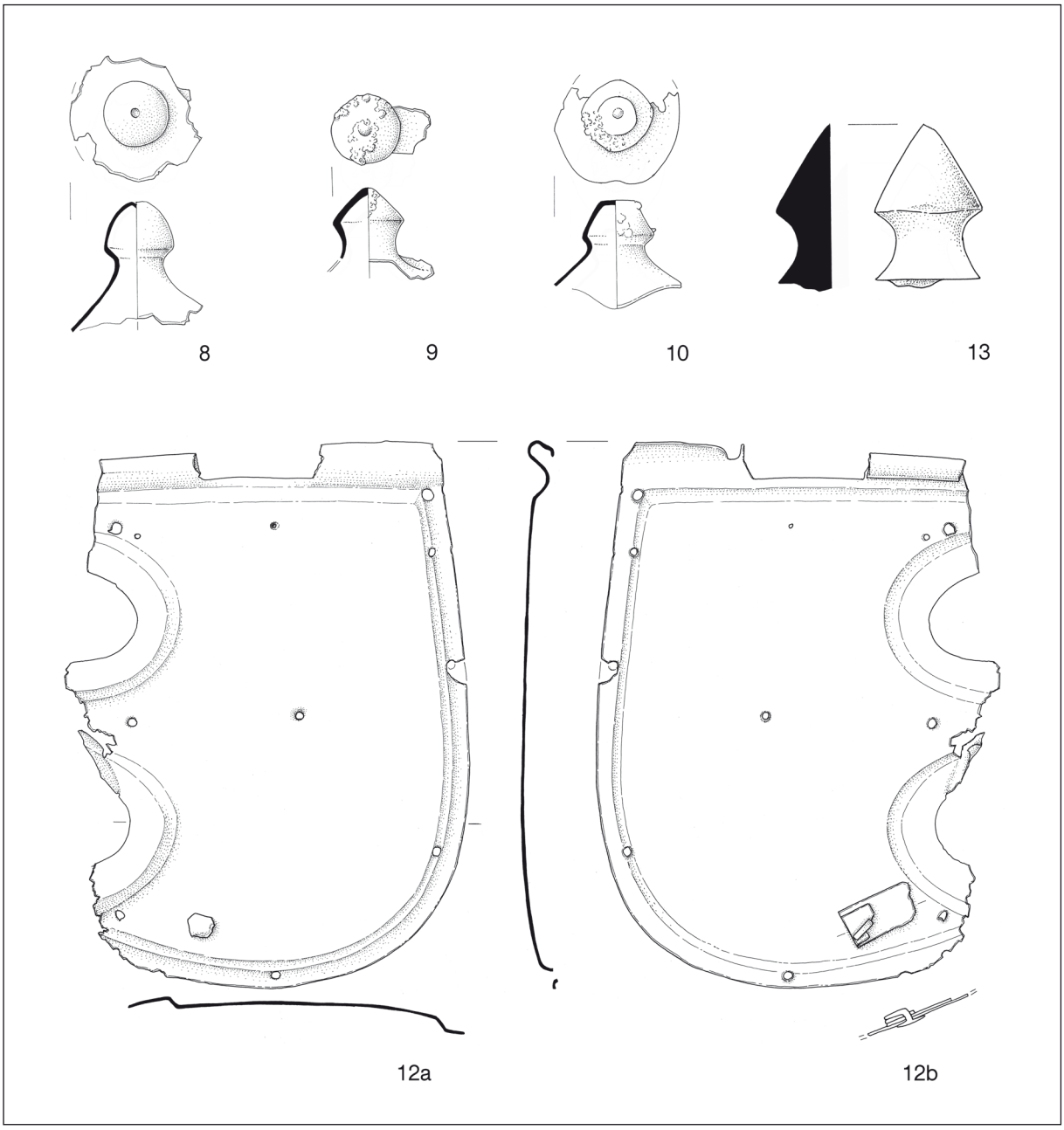
Pl. 4: River Ljubljanica at Vrhnika (helmet Cat. No. **5**). Scale = 1:3.
T. 4: Reka Ljubljanica pri Vrhniki (čelada kat. št. **5**). M. = 1:3.



Pl. 5: Mušja jama near Škocjan (helmet Cat. No. **6**). Scale = 1:3.
T. 5: Mušja jama pri Škocjanu (čelada kat. št. **6**). M. = 1:3.



Pl. 6: River Sava at Mokrice (helmet Cat. No. **7**). Scale = 1:3.
T. 6: Reka Sava pri Mokricah (čelada kat. št. **7**). M. = 1:3.



Pl. 7: Parts of helmets. Ljubljana – Šumi (Cat. Nos. **8**–**10**); Ljubljana – Tribuna (Cat. No. **12**); Strmca near Povirje (Cat. No. **13**). Scale = 1:2.
T. 7: Deli čelad. Ljubljana – Šumi (kat. št. **8**–**10**); Ljubljana – Tribuna (kat. št. **12**); Strmca pri Povirju (kat. št. **13**). M. = 1:2.

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