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A CONTRIBUTION TO THE STUDY OF LAMELLAR ARMOURS

Abstract. – The work is based on the finds of lamellar armours from the Early Byzantine site Svetinja at Viminacium. In addition to the analysis of the finds we presented also the analogies from Early Byzantine, Germanic and Avar contexts and we also paid attention to the so far insufficiently known find from Selenča. Along the armours we also analyzed the related lamellar helmets.

The work includes discussion of the genesis of lamellar armour types – their Oriental origin and their continuance after the 6th century, i.e. the final years of the 6th and the beginning of the 7th century, when lamellar armours were introduced in the Byzantine army and among Germans and Avars as a result of changes in warfare techniques. Finally, we suggest conclusions resulting from the precisely defined context of the Svetinja find.

Key words. – lamellar armours, *lorica squamata*, Svetinja, Selenča, Byzantium, Germans, Avars.

Lamellar armours are certainly an interesting category of archaeological finds but not sufficiently studied. As they had mostly been made of metal, i.e. perishable plates – *lamellae* – completely preserved specimens are very rare.

On the basis of isolated preserved plates it is certainly not possible to draw more serious conclusions, even more so because this type of armour, as we shall explain, was extensively used and is documented both chronologically and with regard to geographic and ethnic characteristics. Regardless of the deep roots of production of lamellar armours, and on the other hand their widespread use in later times, the finds, which may be dated with certainty to the 6th century, i.e. the final period of the 6th and the beginning of the 7th century, stand out. In that regard particularly interesting are finds of armours from the Viminacium site Svetinja, discovered in a clear and precisely dated context and in a state which made possible the appropriate comment of M. Popović in his text about this Early Byzantine site.¹

Fragments of two armours from the Svetinja site were found within a closed archaeological layer – they originate from the floor of a room assumed to had been a blacksmith's workshop. In addition, a considerably smaller amount of mostly fragmented plates of a third

disintegrated armour come from the area surrounding the nearby house 2.²

None of these armours had been completely assembled. One armour from the floor of the smithy was found in a better state of preservation: rows of *lamellae* were registered with traces of leather straps and thongs used to join the plates.

There are also more poorly preserved groups of plates obviously not put together into an armour. They had been left in a pile on the workshop floor and there experienced the destruction and burning down of the structure.³ Thus glued together and corroded these *lamellae* remain to this day (Fig. 1).

From the area around house 2 a total of 38 *lamellae* of the same type of armour has been preserved. Considering the finds from the workshop floor it was possible to count around 570 such glued plates prepared for construction of an armour.

We point out that approximately the same number of plates was used for the better preserved armour. In this case our calculation is much more reliable. We

¹ Поповић 1987: 28–30, Сл. 22, 23.

² *Lamellae* glued together by corrosion from the smithy floor bear the mark C–222, better preserved armour C–191, while *lamellae* from the vicinity of house 2 are marked C–195 and C–196.

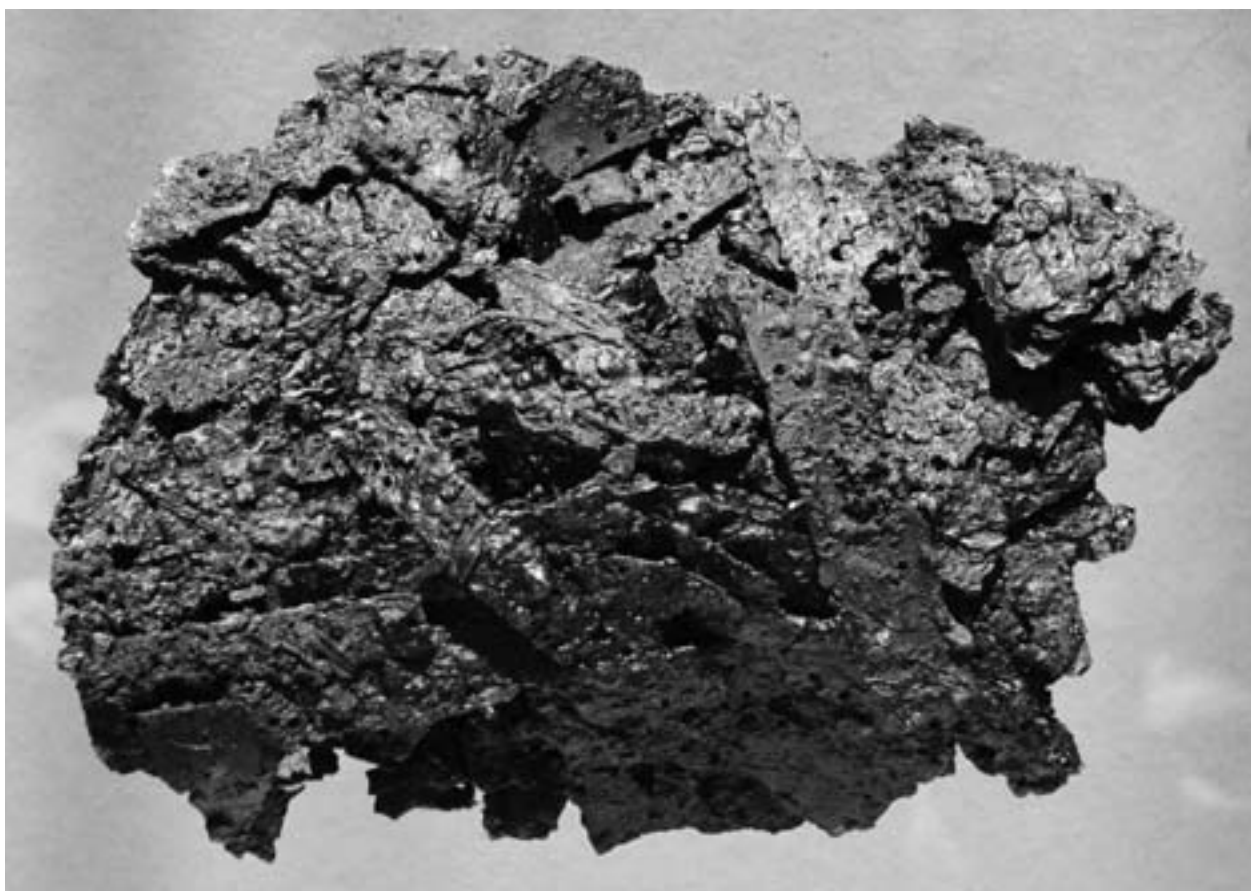


Fig. 1. Glued lamellae from poorly preserved armour from Svetinja (photo V. Ivanišević, no scale)

Сл. 1. Слейљене ламеле лошије очуваної оклопа са Светиње (фото В. Иванишевић, б. р.)

added to the number of completely preserved plates (271 in total) the quotient of total height of the fragments (2259 cm) and the average height of one *lamella*, which we assumed to be 8 cm. So the material in smaller fragments could produce 282 plates. We thus reached the total of 553 *lamellae*, which constituted one armour.

We are now going to consider the *lamellae* of the better preserved armour, whose reconstruction has already been proposed.⁴ In our analysis of the *lamellae* from Svetinja we shall use the results of P. Paulsen, who studied and reconstructed the best preserved lamellar body armour found in grave 12a in the Alemannian necropolis Niederstotzingen.⁵ We shall discuss more thoroughly the finds from that site below.

Plates used for the better preserved armour from the Viminacium Svetinja, as well as for the other two armours, were made of sheet iron and are corroded. On some of them are noticeable the traces of carbonized wood certainly related to the destruction of the smithy on the floor of which they had been found. Also here

and there we may observe traces of grass or hay preserved by corrosion and, much more importantly, traces of leather.

Processes of corrosion, on the other hand, damaged the *lamellae* to such a degree that their classical typologization was made impossible. We must stick to the typology provided in illustration by M. Popović on the basis of well-preserved specimens (Fig. 2).⁶

Lamellae were modeled as rectangular plates the height of which is mostly 7–8.5 cm and the width 1.8 cm. They all have rounded corners, most probably to reduce the sharpness of their edges in order to prevent damaging of leather straps.

They generally have concave notches in the middle of one longitudinal side. The purpose of such shaping

³ Поповић 1987: 28.

⁴ Поповић 1987: Сл. 22.

⁵ Paulsen 1967: 125–133.

⁶ Поповић 1987: Сл. 23.



Fig. 3. Assumed appearance of a row of lamellae (photo S. Pop-Lazić, scale 1:2)

Сл. 3. Претпостављени изглед низа ламела (фото С. Поп-Лазич, Р 1:2)

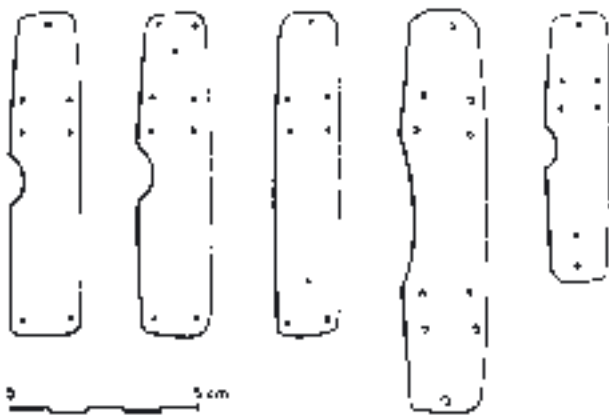


Fig. 2. Typology of lamellae from better preserved armour from Svetinja (after Pojović 1987: Fig. 23)

Сл. 2. Типологија ламела боље очуване оклопа са Светиње (према: Појовић 1987: Сл. 23)



Fig. 4. Lamella of armour from Svetinja, type 3 after Paulsen (photo S. Pop-Lazić, scale 1:2)

Сл. 4. Ламела оклопа са Светиње, тип 3 по Паулсену (фото С. Поп-Лазич, Р 1:2)

is not quite clear but it seems that it should be related to the desired flexibility of the rows – horizontal bands – into which the plates had been arranged.

The notching of the *lamellae* resulted also in shallower grooving of their rows. On the rows of *lamellae* on the armour from Niederstotzingen, just at the level of these notches were encountered iron buckles of small leather belts used to join the horizontal lamellar bands.⁷

Only one type of *lamellae* of the armour from Svetinja was made without such notching, in purely rectangular form. It is not possible to determine with certainty the number of those plates in comparison to the others, or to establish for which part of the armour they had been used, but it seems that their distinct shaping

should likewise be explained by functional reasons. Their size is 8.5 cm x 1.8 cm. One of the reconstructed rows is made of just such *lamellae* (Fig. 3).

Of the same size are the plates of another two types. They have concave notches and they differ according to the disposition of perforations. The plates of this size are the most numerous.

There are also smaller plates notched in the same way, 7.0 cm x 1.6 cm in size. We may assume that *lamellae* of smaller size were arranged in the shoulder section of an armour where the movements of the soldier's body are greatest, so that vertically placed

⁷ Paulsen 1967: 126, 130, Taf. 21.

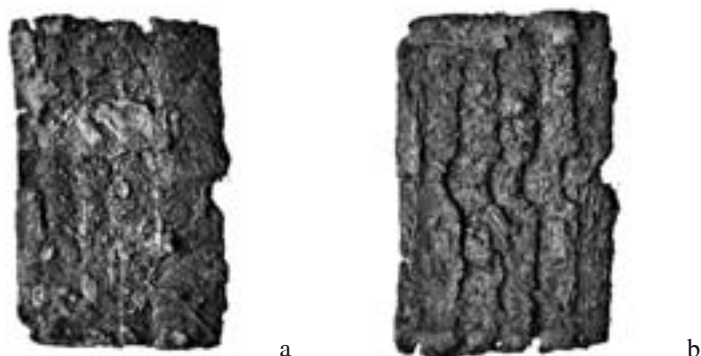


Fig. 5. a) Reverse of a fragment of a row with preserved leather strip used for stitching;
b) Fragment of a row of lamellae with preserved leather band (photo S. Pop-Lazić, scale 1:2)

Сл. 5. а) Наличје фрагмента низа са очуваном кожном итраком цреко које је вршено зашивање;
б) Фрагментни низа ламела са очуваном кожном оишивком (фото С. Поп-Лазич, Р 1:2)

plates of larger size could not adjust to the necessary shape.

We have already explained that due to corrosion it was not possible to determine precisely the percentage of particular types of *lamellae* in the armour structure, but it was possible to count the completely preserved *lamellae*, as well as the fragmented ones from corresponding rows, according to their size. Thus there were recorded 240 plates of all types 8.5 cm high, while there were 60 plates which were 7 cm high. In this calculation we naturally did not take into consideration many fragments which had not been joined in distinct rows. These fragments were of importance when we estimated the total number of *lamellae*, as seen above, but they could not provide data about the actual height of the plates they constituted.

Even though we could not classify all the plates according to their height still the total of 320 *lamellae* of two different heights is absolutely sufficient to confirm statistically the 4:1 ratio in favour of higher plates. This ratio may support the proposed hypothesis that shorter plates were for functional reasons arranged in the shoulder region, where a smaller number of them were necessary than in the chest, stomach and back regions, accordingly protected by the more numerous higher *lamellae*.

Two completely preserved plates of larger size, 10.5 cm x 2 cm, were also found (Fig. 4). M. Popović assumed that these very plates fixed the armour in the shoulder region by being placed horizontally and opposite to the others.⁸ Nevertheless, it should be noted that they are perforated in the same way as the others, which had obviously been placed vertically. Also, among the fragmented plates there was further material which

may have constituted *lamellae* of this type, although not in a considerable amount.

Almost identical plates represent *lamellae* of type 3 according to the typology established by Paulsen. *Lamellae* of this type were identified on the armour found at Niederstotzingen and they are somewhat longer – 11.5 cm – than specimens from Svetinja. They had not been specially arranged in the shoulder region but were used in regular horizontal rows.⁹

Besides *lamellae* of type 3, among other identified types of P. Paulsen from armours from Niederstotzingen but also from Schretzheim, Kirscheim am Reis, Kunszentmárton, Tiszavasvári and Kerč we did not find *lamellae* which fully correspond to those from our Early Byzantine site.¹⁰

Differences are evident also in the disposition of perforations and the modeling of concave notches. While the notches on almost all *lamellae* from Svetinja, except the largest ones, were executed as semicircles of small diameter – up to 1.2 cm – the notches on the types of P. Paulsen are of semi-oval shape – broader and less deep.

Besides rounded corners and concave notches on the longitudinal sides of *lamellae*, the finds from Svetinja show yet another common feature – all of them are perforated. Perforations of small diameter (2 mm) are ordered in somewhat different ways, but generally these small holes were arranged along the top, bottom and lateral sides of the *lamellae*.

⁸ Поповић 1987: 29.

⁹ Paulsen 1967: 127, Taf. 21.

¹⁰ Paulsen 1967: Abb. 62.

Along the top and bottom edge were perforated one, two or three holes. If only one hole was perforated it was near the middle of the narrow side of the *lamella*, and if there were two holes they were made in the corners of that side. Triple perforation was executed in the form of a triangle. At two-thirds of the height were usually perforated four holes arranged in a square. Only in the case of the two largest *lamellae* four quadrangular perforations are placed also on the lower third of the height of the plate.

Thongs, presumably of goatskin, were pulled through the holes and thus plates were sewn together and attached to the lining. Before sewing the plates were arranged so as to overlap by approximately one third of the width, exactly where the holes of one plate correspond to those of the next one. By subsequent fixing through these matching perforations and cross-fixing through the quadrangular holes, rows of overlapping *lamellae* were created.¹¹

On some of the fragments of rows from the inside it is apparent that sewing of adjacent *lamellae* was not carried out directly but via a horizontal leather strap 1.5 cm wide which covers the zone of perforations arranged in a square and placed, as we said before, on the upper third of the height of the *lamellae* (Fig. 5a).¹² The same method was encountered on the specimen from Niederstotzingen and applied in the reconstruction of that find.¹³

On the well-preserved armour from Niederstotzingen the rows are up to 35 cm wide and consist of 31 or 32 *lamellae*.¹⁴ For the corresponding rows of *lamellae* from Svetinja M. Popović assumed a width of 45–50 cm.

The edges of rows were hemmed with leather straps and then stitched to the leather lining of the armour.¹⁵ Leather bands are up to 2 cm wide and bent around longer edges of the rows and around the longitudinal side of the last plate in a row (Fig. 5b). The leather straps were perforated at the same spots as the plates of the row along the top and bottom and through these perforations the lower row was stitched to the upper one and to the leather lining of the armour.

The corrosion preserved in some places not only the bands but also the remains of the leather lining (Fig. 6).

Bands of *lamellae*, then, were arranged in horizontal rows, with the lower ones slightly overlapping the upper ones.¹⁶ On photographs and graphic reconstructions of lamellar armour from Niederstotzingen we can notice their partial overlapping in the same way as M. Popović posited, i.e. from below upward.¹⁷ The same applies to the considerably later Byzantine lamellar armours used in the 10th century and later.¹⁸



Fig. 6. *Lamellae* with preserved traces of leather lining (photo S. Pop-Lazić, no scale)

Сл. 6. Ламеле са очуваним остацима кожног покривача (фото С. Поп-Лазич, б.р.)

D. Csallány, however, regarded the above-mentioned lamellar armour from the Kunszentmárton grave differently: the photograph of the reconstructed armour reveals that rows of *lamellae* are arranged in such a way that the upper ones overlap the lower ones.¹⁹ This is also true of many late analogies recorded by D. Nicolle.²⁰

Regardless of the method of overlapping of the rows of *lamellae*, from top to bottom or vice versa, the rows are covered to a much lesser extent than is the case with the vertical overlap of the plates themselves. We determined after studying the rows of *lamellae* of the armour from Svetinja that plates thus overlap by a third of their width or more. On an average around

¹¹ A written description of assembling lamellar armours, although from 13th century Mongolia, is cited by Kory (2004:387).

¹² Поповић 1987: Сл. 23.

¹³ Paulsen 1967: Taf 57, 58a, 58b.

¹⁴ Paulsen 1967: 125, Taf. 21.

¹⁵ Поповић 1987: 28.

¹⁶ Поповић 1987: 29.

¹⁷ Paulsen 1967: Taf. 22, 54, 55.

¹⁸ Heath, McBride 1979: 7.

¹⁹ Csallány 1933: VI/1.

²⁰ Nicolle 1999.



Fig. 7. Assumed appearance of a row of lamellae of smaller size (photo S. Pop-Lazić, scale 1:2)

Сл. 7. Претпостављени изглед низа ламела мањих димензија (фото С. Поп-Лазућ, Р 1: 2)

60% of each lamella was visible while the remaining 40% was covered.

The standard surface size of one lamella from the Svetinja armour is 14.4 cm², as their dimensions average 8 cm x 1.8 cm. If we multiply the calculated number of lamellae of an armour (553) by the calculated surface of one specimen and reduce the result by 40% for the material generally »lost« in overlapping we reach an armour surface of 4778 cm².

Assuming that the Svetinja armour was composed in the same way as that from Niederstotzingen, i.e. that its rows too consisted of 32 lamellae, all but the first in a row overlapping, as we assessed, by about 40% of the surface of each, we may calculate that the rows of lamellae were 35 cm wide, just like those of the model find.

The surface of such a row of lamellae, tailored after the Niederstotzingen model, would be about 276 cm². The quotient of the total armour surface and the surface of the row of lamellae is 17.3. Better preserved armour from the smithy floor therefore has lamellar material for 17 rows, which should have sufficed for protection of both chest and back.

These 17 rows were beyond doubt originally confirmed by 34 short leather bands along the longitudinal edges of the first and last incorporated lamellae. Nowadays, up to 15 can be confirmed. In two instances the bands were recorded along the longitudinal edges of the shorter lamellae (7 cm high) while for the plates 8.5 cm high a total of eight such hems are visible. It is interesting that here too appears the 1:4 ratio concerning the height of the lamellae.

Along the edges of smaller fragments we encountered traces of leather bands in another five instances, representing at least two and at most five edge reinforcements.

These details by themselves confirm without doubt that there were one or two rows of lower lamellae and

between four and eight rows of higher ones. However, there is much more lamellar material than would be expected considering the number of leather bands from the edge plates of the rows. So at least the majority of lamellae from the armour was found on the smithy floor.

On the basis of earlier calculations it could be concluded, then, that better preserved armour consisted of 17 rows. Four rows of lamellae would have been constituted of smaller plates (Fig. 7), while 12 rows, according to the established ratio of 4:1, would have consisted of lamellae of different types, 8.5 cm high. The rows of lower lamellae would represent the armour in the shoulder region from the front and back while the more numerous rows protected chest, stomach and back.

There remains the problem of the larger lamellae, those resembling type 3 of Paulsen's classification. Perhaps they had been arranged into a seventeenth row, which protected the waist, or secured the horizontal rows of lamellae at their seams.

One of these lamellae is the best preserved of all the discovered specimens and is the only one with the core undamaged by the processes of corrosion. The weight of that lamella is 15.25 g. Its surface is 21 cm². Thus it was possible to calculate proportionally the total weight of all lamellae of this armour according to these parameters and the estimated total surface of all lamellae (7963.2 cm²), larger by 40% than the armour surface, reduced by the overlapping of plates. It was calculated that the original weight of the discovered lamellae was 5.78 kg.

The obtained result, however, is not equal to the weight of complete armour made of this amount of plates, as we did not register the buckles used to join the rows of lamellae.

Other armour plates from Svetinja provide less information. The second group of lamellae from the smithy

floor is, as we have mentioned, highly corroded. In the piles of glued together and poorly preserved plates it is generally impossible to distinguish different types of *lamellae*, although it is worth noting that in the process of examination of the material a few fragmented *lamellae* corresponding to the largest specimens from better preserved armour, i.e. to type 3 after Paulsen, have been recognized.

There was also another type of *lamellae*, not found on the better preserved armour. These are shorter and narrower, 7 cm x 1 cm to 7.5 cm to 1.5 cm. These narrow rectangular plates had at halfway of the longer side continuous shallow semicircular or semi-oval double notches, the diameter of one notch being around 8 mm. From these double notches towards the ends of the *lamellae* on both sides were executed fourfold perforations arranged in a square and, close to the narrower sides of the plate, one central perforation each (Fig. 8a).

It seems that perforations were executed in the same arrangement also on one rectangular lamella, 7.5 cm x 1.5 cm in size, where no notches were identified (Fig. 8b).

The use of such *lamellae* clearly reveals that armours from the smithy floor, though similar, had not been identical. Also, there are no similar armour plates in Paulsen's typology.

The approximate number of 570 *lamellae* of this armour, in comparison with the plates of the better preserved one, shows that in this case too a complete lamellar set, or at least most of it, was discovered.

A small number of mostly fragmented *lamellae* found in the vicinity of house 2 at Svetinja are, as we have already said, similar to the specimens from the smithy floor. Still, one of the plates is particularly interesting, as a bronze rivet is preserved in a perforation, indicating the possibility of later repair.

The significance of the armour from Svetinja is mostly in the context of the find: apart from the fact that by all appearances two complete sets of plates of the body armours have been preserved, they have also been very well dated.

Lamellae from the vicinity of house 2 are related to the Early Byzantine horizon II, which was terminated by the Avar conquest of Viminacium in 584, while the finds from the closed layer at the smithy floor are somewhat later – dated by Mauricius' folles from 587/8 and 590/1. They correspond to horizon III, i.e. the period of short-lived restoration of life at this site until 593–596, when the definite end was caused by a new Avar campaign.²¹

M. Milinković attributes bronze *lamellae* from the nearby site Lanci, from structure I made of wattle, to



Fig. 8a/b. Reconstruction of the types of lamellae from poorly preserved armour from Svetinja (drawing I. Bugarski, scale 1:2)

Сл. 8a/b. Реконструкција типова ламела са лошије очуваној оклопа са Светиње (цртеж И. Бујарски, Р 1:2)

lamellae of a similar type as those from Svetinja. The author states that more precise data about this find were not available to him, while the attached drawing reveals plates of smaller size glued by corrosion to, apparently, a piece of iron.²² Judging by this scaled drawing too, these are really *lamellae* of armour of somewhat similar type but earlier. They were probably the remains of armour of the *lorica squamata* type.²³

Roman armours of this type were also made of bronze or, less frequently, of iron plates. The best preserved specimen of this type, common in the 3rd century, is the armour from Carpow in Scotland.²⁴ The plates of the armour of *lorica squamata* type are shorter and slightly narrower than the *lamellae* from the 6th/7th century, and their free bottom edge was rounded. They vary in size from specimen to specimen but their height does not exceed a couple of centimeters.²⁵

In comparison to the Roman chained armour (*lorica hamata*), which had been in use at the same time, the

²¹ Поповић 1987: 28–29, 35.

²² Милинковић 1998: 245, Т. 68/1.

²³ This site is known in the literature as Rudine. At Rudine were identified two horizons – an antique horizon from the 3rd–4th century and a medieval one, dated to the 12th–13th century (Поповић, Иванишевић 1988: 133, 169–170). Structure I made of wattle should also according to the armour plates be attributed to the antique horizon. According to information from colleagues from the National Museum in Požarevac, D. Jacanović and D. Spasić, to whom I wish to express my gratitude, the structure is even earlier, from the 1st century. By all appearances it had been investigated in 1986, after the archaeological works which resulted in publishing the above-quoted text about Rudine.

²⁴ Southern, Ramsey-Dixon 2000: 97, Fig. 16.

²⁵ Goldsworthy 2003: 128.

lorica squamata type was more prone to damages, hence plates from armours of this type are frequent archaeological finds either as single pieces or in smaller groups.²⁶

Plates of these armours were arranged in rows, where the upper row partially (by about a quarter) overlaps the lower one, thus giving the armour the appearance of fish scales. The rows themselves were made of partially overlapping plates, but sidewise, whereby the plates were attached to each other via two vertical matching perforations. Perforations arranged along the top of plates served to stitch them to the lining.

A crucial difference in relation to later lamellar armours is the material used: armours of *lorica squamata* type were much more frequently made of bronze plates and lamellar ones were made of iron plates. Also, the plates of the *lorica squamata* armour do not have perforations along the bottom for fixing them, and the rows, on that side too. A further essential difference is that when lamellar armours are concerned horizontal rows of plates were often arranged in the opposite way, so that the lower row partially, in the narrower band, overlaps the row placed above it. However, first of all iconographic but also archaeological evidence of later lamellar armours confirms the existence of specimens with rows of *lamellae* overlapping from top to bottom, as has already been mentioned.

According to the iconographic evidence and the data supplied by Vegetius it could be concluded that from the time of Gratianus body armours were much less in use. But there is also another option. It is possible that such a position is distorted, being based mainly on the image of the East after the defeat by Sassanians and especially after the catastrophe at Hadrianopolis in 378, when probably a huge amount of armours as well as other valuable military equipment was seized. The illustration of contemporary *fabricae* in the West, from the *Notitia Dignitatum*, which immortalizes their assortment of products: crested helmets, spears, shields, axes but also the metal body armours, is highly indicative in this respect.²⁷

A relief representation of scale armour in the Museo Chiaramonti in the Vatican, probably originating from the triumphal arch of Diocletianus, relates to an earlier period. From the synagogue at Dura Europos comes a fresco depicting battle scenes with a valuable realistic representation of 3rd century soldiers in scale armours. A wooden sculpture from Egypt, now in Berlin, depicts the battle between the Rhomaioi and the barbarians for some town, where some of the Rhomaioi soldiers have scale body armours. This relief is dated

rather extensively, as the illustrated battle could have happened at any time between the 4th and 6th centuries. From the 6th century dates a representation of soldiers in scale armours from ivory-made Maximianus' throne in Ravenna.²⁸

Plates from lamellar armours corresponding to ours from Svetinja are not particularly rare finds. Thus they were encountered at three hillforts in Slovenia, at Gradišče nad Bašeljem,²⁹ Zidani gaber nad Mihovim³⁰ and Rifnik pri Šentjurju³¹ as well as at the fortification on Gradina in Biograci near Lištica in western Herzegovina.³²

Lamellae of armours have also been recorded in Early Byzantine fortifications at Gradina on the Jelica,³³ near Bregovina³⁴ and at Caričin Grad.³⁵ From the same context are finds from Early Byzantine fortifications Gornji Streoc and Čečan on the slopes of the Čičevica mountain in Kosovo, in the Ibar valley.³⁶

The above mentioned finds may be roughly dated to the 6th century.

D. Csallány mentions also the finds of lamellar armours from necropoles of the Gepids. There are a drawing and a photograph depicting highly corroded iron plates from graves 31 and 75 of the necropolis Szentes – Berekhát and from grave IV at the site Szentes – Kőkényzug.³⁷ From the site Szekszárd are quoted a few dubious finds, such as those from grave 354 with

²⁶ Goldsworthy 2003: 127; there are also, for example, such individual finds of plates from Singidunum, from the area of a military camp and its surroundings (Црнобрња, Крунић 1997: 279, кат. бр. 450; Nikolić, Pop-Lazić 2005: 35, sl. 14/11) and from Dura Europos (Coulston 1990: 147).

²⁷ Coulston 1990: 149; Southern, Ramsey-Dixon 2000: 98, Fig. 17.

²⁸ Coulston 1990: 145–146, Fig. 6; Southern, Ramsey-Dixon 2000: 99.

²⁹ Od Rimljanov do Slovanov 2001: cat. no. 226.

³⁰ Od Rimljanov do Slovanov 2001: cat. no. 236.

³¹ Od Rimljanov do Slovanov 2001: cat. no. 238.

³² Six lamellae are, however, incorrectly identified as belt endings from the garniture ascribed to the chief of the Slavic garrison at this site in the 8th century (Čremošnik 1989: 97, 114, T. V/1–6).

³³ Milinković 2001: Abb. 15/2.

³⁴ Милинковић 1999: 104–105, сл. 8a/b.

³⁵ Bavant, Ivanišević 2003: 73–74, kat. br. 42; under numbers C–157/02 and C–158/02 are inventoried rows of around 30 and 20 lamellae from this site that are unpublished. I wish to express my gratitude to Dr. V. Ivanišević for providing me with information and enabling for me to see the objects.

³⁶ From Gornji Streoc come four *lamellae* and from Čečan one. Early Byzantine finds from these sites will be published in this volume of *Starinar* by V. Ivanišević and P. Špehar; I am grateful to them for this information.

³⁷ Csallány 1961: 263, T. LVI/8, 10; T. XXI/8.

very interesting inventory among which stands out a Germanic stamped vessel.³⁸

Also very significant is the find from grave 80 from the large necropolis Kőlked – Feketekapu B. This grave belongs to group IX of the graves, which is related to the Gepids, who in the early period (568–630) of Avar domination were still inhabiting the hinterland of the Khaganate. This find was discovered below the feet of the deceased in a rich burial and it was identified as a chest armour. It was made of iron, combined from long lamellar strips (around 30 cm) and rows of smaller ones placed underneath, resembling *lorica squamata*, of the fish scale shape. While for long lamellar strips as closest analogies are quoted the corresponding helmet elements from grave 12c from Niederstotzingen, a matter to be discussed below, the lower element is related to the Late Roman tradition. The body armour itself is assumed to be the product of a Byzantine artisan.³⁹ The armour from grave 628 from the necropolis Budakalász – Dunapart was combined in the same way.⁴⁰

There are also finds from Alamannian territory of in the upper course of the Danube in present-day south Germany, the most representative of them being from grave 580 of the Schretzheim necropolis, dated to 590–620. It is a fragmented lamellar armour in which an adult male was buried.⁴¹

As we have already mentioned, the system of joined plates was not used only for making body armours. Worth mentioning is the find of a helmet whose cap was covered with partially preserved iron *lamellae*, from Sinj, at the Legrad–Šoderica site on the right bank of the Drava river. It is similar to the helmets found at two Lombardian necropolises in central Italy, at the sites Castel Trosino and Nocera Umbra, one at each necropolis, that are roughly dated from 580 to 620, and also to the specimen from the Black Sea coast, from the tomb in a catacomb at the site Kerč, dated to the 6th century.

The helmet from Legrad – Šoderica is assumed to have been in Lombardian or possibly Early Avar use and is dated to the late 6th century. Like the noted analogous helmets from Kerč and Italy, it belongs to the so-called eastern type of iron helmets of central Asian origin. In that region they have been attested on wall paintings and from there they reached the Black Sea area, whence probably thanks to the Avars (although there is very scarce archaeological evidence for their use of lamellar helmets) they reached the Germanic world around the year 600.⁴²

É. Garam also mentions the find of a lamellar helmet from Németszentpéter/Sînpetru German, published

earlier and dated by the coins of Heraclius and Heraclius Constantinus to the first third of the 7th century.⁴³

The study of Z. Vinski about the Sinj find is in a sense followed by the important work of J. Werner concerning the above-mentioned armour from Niederstotzingen and particularly the helmet from grave 12c of that necropolis in connection with a chronologically parallel but geographically very distant analogy from South Korea, from the site Bockhondong. Burials at Niederstotzingen are dated to the beginning of the 7th century.

Both helmets were made of rows of rather large *lamellae*, which were tied to the cap from above and fall approximately to the ears. In the case of the Niederstotzingen helmet the ears are protected by *paragnatidae* and the neck area with mail. Elongated *lamellae* on the specimen from Bockhondong are, however, in the neck region followed by rectangular and smaller *lamellae*, similar to our *lamellae* from the body armours or to those on the helmet cap from Legrad – Šoderica.

J. Werner, like Vinski before him, recognizes close analogies to the Niederstotzingen helmet in the wall paintings of eastern Turkestan and, naturally, clear relations with the Far East in light of the finds from Bockhondong, while he does not deal with the genesis of lamellar armours.⁴⁴

Remains of body armours of lamellar type are known, besides from Early Byzantine settlements and Germanic graves, also from burials at Avar necropolises. Even though it is mentioned in Pseudo-Mauricius' *Strategicon*, as an important historical source, that Avar infantry used body armours, the archaeological evidence does not confirm this. Moreover, even in the burials of cavalrymen, who were certainly the leading force of the Avar army, body armours are very rare finds.

On the other hand, surviving fragments of early medieval metal *lamellae* from the Crimea are believed to be Avar.⁴⁵

J. Kovačević considers that *lamellae* of the armour found in the female and childrens' graves from those

³⁸ Rosner 1999: 49, Taf. 25/15.

³⁹ Kiss 2001: 26, 325–327, 345, 347, Abb. 7, Taf. 26/3, 27/1, 102.

⁴⁰ Kory 2004: 381.

⁴¹ Koch 1977: 116, T. 154.

⁴² Vinski 1982: 12–15, T. V/1, 3; T. XV.

⁴³ Garam 1992: 159.

⁴⁴ Werner 1988: 6–7, 13, Abb. 11, 15.

⁴⁵ Nicolle 1999a: 39.

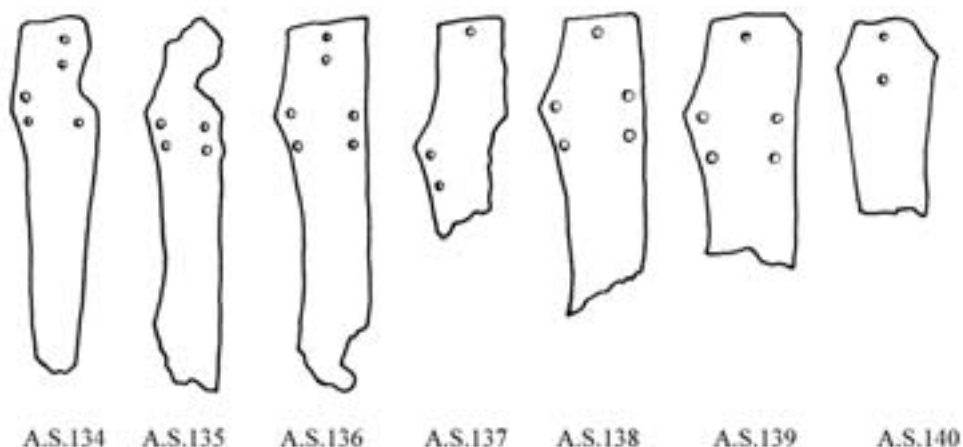


Fig. 9. Armour plates from Selenča (Museum of Vojvodina documentation, no scale)

Сл. 9. Оклопне плочице из Селенче (Документација Музеја Војводине, б.р.)

necropoles had a certain apotropaic value attached to them.⁴⁶ On the other hand, it is worth mentioning that in the context of Avar burials remains of lamellar armours were found in around 130 graves, 40 each male and female and 15 childrens', while for the rest the sex of the deceased was not determined. So *lamellae* were encountered in graves of children as well as of persons over 60 years of age, while differences in the concentration of finds in male and female graves are most probably the result of local funerary customs.⁴⁷

From among the finds of plates from characteristic burials we would like to mention seven *lamellae* placed as offerings in the grave of a cavalryman from Szegvár – Sápoldal, dated by the coins of Mauricius (582–602). The find of a single *lamella* in the grave at Hajdúdorog is dated by the coin of Heraclius from 610 to 641.⁴⁸

One of the best preserved lamellar armours, similar to those from Svetinja and mentioned earlier, comes from the well-known grave of a goldsmith from Kunszentmárton. It is certain that this was not the grave of a Byzantine artisan but of an Avar one, as for a Roman citizen an equestrian burial would have been unthinkable.⁴⁹ From the territorial point of view there are closer analogies with finds of individual *lamellae* from the necropolis Polet in Vrbas⁵⁰ and from graves 2, 17, 24 and perhaps 122 of the necropolis at Čik near Bačko Petrovo Selo, likewise from the earlier phase of Avar domination.⁵¹

The armour from Selenča has been mentioned incidentally and without more precise data. It is not, however, apparent whether D. Mrkobrad assumes a lamellar type of armour.⁵² Nor does Z. Vinski, in his

more substantial review of this interesting but to a considerable degree ambiguous find of a grave (?) with rich offerings and, most likely, cremation of the horse and symbolic burial of its equipment (?), describe the armour; he only mentions its appearance. The explanation is suggested that the armour and the *Baldenheim* type helmet, represented in the finds of the cheek plate and joint, within this context are a war trophy. Otherwise, the grave from Selenča was on the basis of elements of belt garniture, horse harness, stirrups, snaffle bit, spear, etc. identified as Avar and dated to the first half of the 7th century.⁵³ D. Csallány, quoted by Z. Vinski, in his review of this set and with regard to the object of our interest, simply notes that it was a part of chest armour.⁵⁴

⁴⁶ Ковачевић 1977: 115–116; in that context we note the *lamellae* from Early Avar necropolis Csepel – Háros (Nagy 1998: 167, Taf. 113/15–21), a row of about 20 iron *lamellae* from the grave from the necropolis Szekszárd (Rosner 1999: 43, Taf. 21/8) and the grave find from the necropolis Vác – Kavicsbánya (Tettamanti 2000: 86, Taf. 21/382–1).

⁴⁷ Kory 2004: 393.

⁴⁸ Bóna 1979: Abb. 1, 2/17; Garam 1992: 159, 171.

⁴⁹ Daim 2003: 480.

⁵⁰ Nagy 1971: 215, T. XXXII/2.

⁵¹ The necropolis is not published, so I gathered information from field documentation (for my Master's thesis) in the Regional Office for Protection of Cultural Monuments in Novi Sad and in the City Museum and Gallery in Bečej. Here too I express my thanks to colleagues from these institutions, Ivana Pašić and Branislava Mikić-Antonić.

⁵² Mrkobrad 1980: 100.

⁵³ Vinski 1958: 13.

⁵⁴ Csallány 1956: 85.

This find is housed in the Museum of Vojvodina in Novi Sad. According to the available data, some workers discovered this hoard (?) in a bronze cauldron in the course of field works at the site Jaroš in Selenča in 1943.⁵⁵

Among other things seven armour *lamellae* were found in the cauldron (Fig. 9). Judging by the drawings all of them are fragmented, at least to some extent. The best preserved are three *lamellae* – A.S. 134–136, 9.8 cm x 2.4 cm in size. Other *lamellae* are 2.2–2.6 cm wide. The three best preserved weigh 12 g and just one specimen, A.S.135, weighs 9 g.

It has been suggested that the *lamellae* from Selenča were hammered of bronze. Nevertheless, the partially preserved plates entirely resemble the much more frequent ones made of iron. This resemblance is conspicuous in the usual disposition of perforations as well as in the wide semi-oval notches on one longer side. According to both parameters the plates A.S.138 and A.S.139 would correspond to Paulsen's type 3, i.e. to the larger *lamellae* from the armour from Svetinja. It is possible that these two *lamellae* are in fact two halves of a single one, which in that case would be of expected size, 10.3 cm x 2.6 cm, and weighing 13 g.

The three well-preserved *lamellae*, however, reveal a difference too: the drawing does not show perforations along the bottom edge of the plates. Perhaps patina is the reason for this, but since we had no access to the find we cannot make more precise comments.

Yet in accordance with Paulsen's typology, types 6–8, 18 and 19 have no perforations along the bottom edge. According to the disposition of perforations but not to the shape of the *lamella*, the object A.S. 136 might to a certain extent be related to type 7, i.e. the *lamella* from the armour from Kirsheim. Still, the plates of Paulsen's type 7, besides being differently shaped, are also of considerably smaller size; also in that case two perforations on the top of the *lamella* and four perforations arranged in a square beneath them are more distant from each other than in the case of plate A.S.136. More generally, all *lamellae* without bottom perforations from the quoted typology are of smaller size, except the one originating from the armour from Kerč, representing type 19.⁵⁶

We have recognized in the literature still another object which could probably be identified as an armour *lamella*. It is a find from the inhumation burial of a child (grave 6) from the biritual necropolis Bdinci in northeastern Bulgaria. Two perforated iron plates, 4 cm x 1.5 cm and 3 cm x 1.5 cm, could easily be fragments of two or alternatively of one armour *lamella*.⁵⁷

There are some more finds of armour *lamellae* made of sheet iron from the nomadic context. First of all we refer to plates found at the necropolis Kudrige on the Altai mountain, in total dated to the 6th–7th century. This horizon of burial is related to a population similar to the Danubian Avars.

From the same territorial context comes the find from the necropolis Berelj, more important for us as along the edges of a row of overlapping *lamellae* there is preserved a leather band corresponding to the way such bands were used for the armour from Svetinja. The lamellar armours discovered in this area are dated rather extensively, from 3rd–4th century for the finds from Ob and the Kustanajskaja region to those from Tuva, dated by the coins from the years 713–741.⁵⁸ Even later is the find of an armour *lamella* from the remains of the Siberian Tjuhtjatskaja culture of the 9th–10th century.⁵⁹

From the 6th century onwards, lamellar armours will for centuries form part of the equipment of the Byzantine army, as of other soldiers. There is also information about the numerical prevalence of these armours (*κλιβάνια*) in comparison with others in Byzantine use in the middle of the 10th century, as a consequence of their simpler composition and thus lesser value in relation to the mail armours (*λωρίκια*) worn mostly by officers.

However, besides »ordinary« there were also »better« *κλιβάνια*. Luxurious gold armours of this type were worn by prominent individuals and members of the ruling family.⁶⁰

We are going to consider in brief also the later finds of armours.

The lamellar type of armour was still in the 11th and even in the 12th century a common element of the equipment of the Byzantine warrior and in artistic sources we can follow this type of weapon even later. Iconographic evidence is rich but archaeological finds are in contrast extremely scarce.

We know of the remains of two lamellar armours of the indicated dating from the Pernik fortress and

⁵⁵ It was not possible to see this find, but thanks to the help of the keeper, Stanko Trifunović, which I hereby gratefully acknowledge, I was able to obtain information about the *lamellae* and their drawings from the Main Inventory Book of the Museum of Vojvodina. The *lamellae* bear inv. numbers A.S. 134–140.

⁵⁶ Paulsen 1967: Abb. 62/6–8, 18, 19.

⁵⁷ Вьжарова 1976: 141, 146, Обр. 90/3,4.

⁵⁸ Гаврилова 1965: 16–18, 104, Рис. 4/13, Т. V/1.

⁵⁹ Кызласов 1981: 56, Рис. 33/57.

⁶⁰ Koliass 1988: 46–47, 49.

trapezoid *lamellae* with one truncated corner from the Ras fortress. It is likely that here too the preserved *lamellae* were elements of two armours. A closer typological analogy for the finds from Ras has not been established; based on the stratigraphic context they are dated to the second half of the 12th century.⁶¹

Lamellae were in this later period of use mostly made of iron, but we know from the historical sources of specimens made of leather or horn. Armours were usually sleeveless or with very short sleeves and still primarily extending to the waist, although on some pictorial representations from the 11th century there are also specimens reaching down to the knees.⁶² Until this period there also continued the use of mail armours, which were commonly worn also in the later medieval period in Europe.⁶³

There is substantial evidence, archaeological and artistic, of that later use of lamellar armours also in areas larger than those under Byzantine control and by various ethnic groups. Some of the finds were mentioned earlier, within the context of nomadic use of this type of weaponry. D. Nicolle gathered numerous illustrations on reliefs, archaeological finds and descriptions from manuscripts from the territories of Serbia, Bulgaria, Georgia, Armenia, Ukraine, Mongolia, Egypt, Iraq, Iran and from Anatolia. They are overall dated from the 9th to the 14th century, but with strong emphasis on the last three centuries of this extensive time span.⁶⁴

In other parts of Europe, however, there are virtually no archaeological or pictorial attestations of the use of lamellar armours of this time. The only exceptions in the 12th and 13th centuries come from the Baltic region, from Scandinavia and from the zone of Viking settlements in eastern Ireland. The evidence from the 14th century is richer again.⁶⁵

In combat, but also in the everyday life of soldiers, the fact that lamellar armour was flexible and that it made possible free movements was of great importance.⁶⁶ This is certainly one of the most important reasons for the prolonged and in the ethnic and territorial senses extensive use of this type of defensive weapons.

Along with the principle of manufacture of scale armours itself, another important constructive feature persevered across the centuries. All these armours, including *lorica squamata* and other Roman types, lamellar armours of the 6th/7th century, as well as those used by the Byzantine army in the 10th and 11th centuries and later, were stitched to some kind of lining, usually of leather, rather than being worn directly over the tunic. For these latest specimens there is evidence of linen or woolen lining.

The lining, which in the earlier period was known also as *thoracomachus*, on the one hand alleviated the pressure of armour weight of about 10 kg and even up to 16 kg (as was that of some 7th century armours) on the body of the soldier, and on the other hand it absorbed the impact of projectiles. The effect of preserving body warmth is also evident.⁶⁷ In order to protect soldiers and their equipment from more severe weather conditions, another piece of clothing was worn over the armour if necessary.⁶⁸

In the context of these general remarks we may return to the better preserved armour from Svetinja. We have already mentioned that remains of leather lining are visible here and there on its lamellar rows, but it is clear that it supported a lesser armour mass than that mentioned above. While the mass of 5.75 kg does not equal the original armour mass, it approximates it.

We would also like to deal with the question of the origin of lamellar armours. As the origin of corresponding helmets has been found in the East, so too some other authors assume the Eastern origin of this type of body armour, remarking that later on they remained in use in Byzantium for a rather long time.⁶⁹

Niederstotzingen is a site where two forms of *lamellae* – made defensive weaponry have been found. P. Paulsen, commenting on the lamellar armour, writes about the deep Asian roots of objects of a similar kind made of bone, horn, iron and bronze,⁷⁰ while J. Werner commented in greater detail on a related helmet from this site in light of its resemblance to the helmet from Bockhondong and, more generally, the links with evidence from the East, as we already mentioned above. We repeat that these finds are dated to the beginning of the 7th century.

U. Koch also mentions the Eastern origin of the lamellar armours, considering the Allemanian context of the grave from the necropolis of Schretzheim and their use by Lombards, and finally quotes existing opinions about the Byzantine origin of this type.⁷¹

⁶¹ Popović 1999: 260, sl. 220/5–7.

⁶² Heath, McBride 1979: 7; Koliás 1988: 54.

⁶³ Popović 1999: 260; Heath, McBride 1979: 6.

⁶⁴ Nicolle 1999.

⁶⁵ Nicolle 1999a: 137–138.

⁶⁶ Kory 2004: 387.

⁶⁷ Goldsworthy 2003: 129; Coulston 1990: 151; Heath, McBride 1979: 7; Koliás 1988: 50, 51.

⁶⁸ Koliás 1988: 58, 59.

⁶⁹ Macdowall, Embleton 1995: 60.

⁷⁰ Paulsen 1967: 132.

⁷¹ Koch 1977: 116.

Against this background the find from necropolis Kölked – Feketekapu B is precious. As already noted, it was ascribed to a prominent Gepid whose grave is in the group of burials dated from 568 to 630. We also mentioned that A. Kiss assumed that it was the work of a Byzantine artisan. This assumption could be supported by the fact that part of the armour was made in a manner similar to the Roman *lorica squamata* type, although this type itself is, as we shall see, essentially of Eastern provenance. On the other hand, the upper part of the armour, consisting of long lamellar strips, wholly resembles the mentioned products of Eastern origin. In this respect it could be concluded that Byzantine artisans accepted the Eastern method of armour manufacture, and that in the case of this concrete find such work was combined with that characterising an artisan tradition closer to them.

The differences between the two types of armour could certainly be explained as a result of changes in the method of warfare. It should be remembered that the range of arrows shot from the nomadic composite bow is five times longer than when the classic bow is used, even up to 400 meters.⁷² Trilateral arrowheads shot from those bows in battle are much faster and of greater penetration.⁷³ The arrows released from a distance of 300 meters could cause contusion and from 100 m they pierce the armour. We may add that recent tests have shown lamellar armours to have been far more resistant to arrow impact than the mail ones too, which holds both for the Roman and the medieval periods.⁷⁴

In this light the noticeable tendency of extending and reinforcing body armour in later times is easily explained. Their adaptation to the new practices of warfare was of a tactical as well as strategic character, which exceeded the protection of the individual soldiers. Dense formations of infantry remain relatively protected from the attacks of the archers and capable of inflicting the final blow; that was the great advantage of the Rhomaioi over unarmoured opponents.⁷⁵ In view of this it should be stressed that in the Early Byzantine army infantry played a major role also in direct clashes with warriors from the East: even the swift horsemen of the latter could not have been particularly efficient against the somewhat static but well-trained infantrymen.⁷⁶

It is worth mentioning too that the organized Empire was able to establish sources of raw material and consequently to provide larger quantities of military equipment for its troops, and that this, together with technological superiority, was likewise the secret of the obvious advantage of the type of weaponry we are discussing in this work.⁷⁷

Also important was the very appearance of the formation of armoured soldiers: besides the clear functional aspect body armours, due to their appearance and decoration, created also a psychological effect both on those wearing them and on their opponents.⁷⁸

However, not only infantry used armours. Already in Late Roman times there existed a »parade« variant of *lorica squamata* type of armour, worn exclusively by cavalrymen.⁷⁹ Formations of armoured cavalrymen – *kataphraktarioi* and *clibanarii* – were organized according to the Parthian model.⁸⁰

Even later, in the Byzantine period, there were such products, which because of their value could not have been available to ordinary soldiers but probably to officers and armoured cavalrymen,⁸¹ i.e. to the highest-ranking warriors, as we have already mentioned. After all, the Greek term for armour of this kind in a broader sense is *κλιβάνιον*, from the Latin *clibanarius*, which is as we have seen the term for a kind of heavily equipped cavalrymen. The notion of *κλιβάνιον* is, however, broader than that of lamellar armour, as it includes also the scale armours.⁸²

However, it would not be appropriate to claim that exclusively the noted practical reasons of changes in warfare techniques prompted a mere typological genesis in the Roman production of body armours in such a way that *lorica squamata* evolved into lamellar ones. Such a conclusion could likewise not be drawn either on the basis of the clear continuity in the use of body armours or by following the existing evidence.

Besides the described structural similarities between the two groups of armours, the essential structural differences have been noted too.

A technological difference is quite conspicuous as well: it has been emphasized that Roman scale armours were mostly made of bronze elements and lamellar ones of iron parts. For these reasons, but also on the basis of well-documented and in our work underlined relations of lamellar defensive weaponry with the production in the Asian East, we are convinced

⁷² Ковачевић 1977: 116.

⁷³ Ricz 1983: 8.

⁷⁴ Nicolle 1999a: 32, 107.

⁷⁵ Coulston 1990: 150–151.

⁷⁶ Nicolle 1999a: 27–29.

⁷⁷ Coulston 1990: 151.

⁷⁸ Kolias 1988: 61–64; Kory 2004: 387.

⁷⁹ Coulston 1990: 147.

⁸⁰ Pohl 1998: 30.

⁸¹ Macdowall, Embleton 1995: 60.

⁸² Kolias 1988: 45.

of such an origin of lamellar armours, by now rather generally accepted.

Actually, the complete production of armours called *κλιβάνια* by the Byzantines originates in a broader sense from the East. The Roman type *lorica squamata* is in this view just one of the later manifestations of the group of armours of scale type, the earliest examples of which are confirmed already in the second millennium BC in Armenia, Georgia, the Minoan world... The Scythians wore them in the 6th century BC and the Sarmatians in the 3rd century BC.⁸³

The earliest occurrence of lamellar armours is most probably attested on Assyrian reliefs from the 9th–7th centuries BC and by one burial find from that area. This type spread quickly, above all to Iran and the steppes of central Asia, but it remained in use in the home territory at the time of the Achaemenides and in the Seleucid period. One of the confirmations is the representation on a votive relief in Palmyra from the 1st century AD, while we have already mentioned a two centuries later confirmation from Dura Europos.

As a result of the mobility of nomadic warriors this type of weapons reached Europe and eastern Asia, China and Japan and remained in use for a long time. It was brought to Europe by Scythians and later by Sarmatians. It is recorded to have been used by the Etruscans from the 5th to the 2nd century BC.

The Romans used two types of lamellar armours – one with *lamellae* of the scale type and the other with elongated ones.⁸⁴ The Huns used lamellar armour during their stay in Europe too.⁸⁵ In the Byzantine army the lamellar type of *κλιβάνιον* appeared in the 6th century as a result of new techniques of warfare, where the archers' role in the initial stages of the battle was of utmost importance.

As we follow the genesis of this type of weapons from the East it is logical that finds have been registered in various ethnic and cultural contexts – from the burials of Asian nomads and the Germans to those from Early Byzantine fortifications. Lamellar body armours are certainly not the only manifestation of military equipment which the Byzantines took over from the populations in the East with whom they were in contact or conflict. Thus it is commonly believed that stirrups were introduced by the Avars; trilateral arrowheads and nomadic composite bows are also of eastern provenance,⁸⁶ though this type of bow was not in prevalent use in the Byzantine army.⁸⁷

From the above discussion it is clear that archaeological documentation concerning lamellar armours found outside Early Byzantine contexts is more abun-

dant, but this on no account means that Rhomaioi use of this defensive weapon was less intensive.

Most of the analogous products come from graves as closed archaeological entities: as we know, we should not reckon with Early Byzantine burials of armoured warriors. Again, the finds from Early Byzantine fortifications are mostly restricted to individual *lamellae*, sensitive to corrosion; as such they were often easy to overlook and disregard.

The emergence of lamellar weapons in Europe when the Early Byzantine context is concerned could, then, be dated to the 6th century. Logically, these finds occur somewhat later among the Germanic mercenaries or the Avars, and reach out to the early 7th century. Our specimens from Svetinja are precisely dated within this chronological framework.

The rampart of Svetinja was certainly erected at the time of Justinian's restoration of the Danube *limes* as an element of defense of Early Byzantine Viminacium, whose main fortification was situated around 1200 m to the east. According to the initial plan this rampart should have been the only masonry barrier for attackers on the main fortification, as Svetinja was situated on some kind of peninsula, protected on two sides by the Mlava river and the Danube backwaters. When it turned out not to be adequate there were attempts to transform this site into a *quadriburgium*, but this plan was abandoned.

The Avars destroyed Viminacium already in 584, and at that time part of the rampart at Svetinja was damaged too. From the end of the seventh decade of that century the Gepids had been settled at Svetinja as its garrison. In the sense of archaeological stratigraphy, horizon III, with several objects built on top of the layer of debris along the damaged rampart, corresponds to the short-lived period of restoration of the site. One of these structures is the smithy where the armours were discovered on the floor.

⁸³ Kory 2004: 376–381.

⁸⁴ Kory 2004: 388–391.

⁸⁵ Nicolle 1999a: 39.

⁸⁶ Archaeological documentation of trilateral arrowheads in Byzantine use is rather substantial; bone plates for composite bows in the Early Byzantine context were found at Caričin Grad and at Pontes and in Tekija; also at the site Golemanovo Kale near Sadovec in Bulgaria (Илнeкaп 2004: 186, кaт. бп. 607, 608, T. XXXV/607; Uenze 1992: 500, Kat. 27, Taf. 43/4). Finds from Macedonia, from the towns Heracleia Lyncestis and Stobi, Mikulčić identifies as Hunnic, from the middle of the 5th century (Mikulčić 2002: 266, 431; Abb. 159/1, 340/6,7).

⁸⁷ Pohl 1998: 31.

Although this horizon no longer yields fragments of typical Gepid pottery, there are still some finds which suggest the presence of Germanic mercenaries. These are the very finds of lamellar armours, as well as of a shield, and a discovered bone plating of a comb case is likewise thought to be of Germanic origin.

The final destruction of Svetinja was to follow between the years 593 and 596.⁸⁸ In view of the above, the Germanic context of the finds of lamellar armours at Svetinja is clear. The Germanic context, however, does not imply Germanic manufacture. We cannot know whether the craftsman from the smithy was of Germanic or Rhomaioi descent. We cannot even determine whether he himself produced the armours found *in situ* or, more probably, just serviced them; but it is certain that they had been intended for prominent Germanic warriors who constituted the garrison of the damaged rampart at Svetinja.

It is apparent that it was an army of *foederati* incorporated in the planned defensive strategy of Byzantium in this area; hence the context of the find is necessarily twofold, Germanic but also Early Byzantine.

Precisely the example of Svetinja reveals that members of Germanic tribes in the territory of the Empire were provided with and used lamellar armours in their capacity as Byzantine soldiers, *foederati*. This, of course, also applies to the remains of lamellar armour from the vicinity of house 2, which dates from the preceding horizon, before the destruction in 584,⁸⁹ but not to the geographically distant analogies from the Germanic context, which cannot be associated with Byzantium and its military system.

At any rate, it does not seem that the smithy at Svetinja was a workshop for the production of weapons. This was a peripheral Byzantine site in a troublesome area, so there is no great probability that Byzantine military command would allow the existence of a weapon-producing centre whose craftsmen could in case of the fall of the town continue to work for the enemy.

In that regard it should be mentioned that the object identified as a smithy on the basis of metal dust and pieces of slag was itself of rather small size, ca 3 m x 3 m.⁹⁰ A workshop of such size could not have been a weaponry *officina*. Additionally, the two armours discovered there had not been made of identical *lamellae*, and this also does not indicate the smithy as the place of their manufacture. In case production of armours still took place there, which we doubt seriously, it must have been on a rather small scale.

So we see that the garrison of *foederati* at Svetinja not only obtained a very modern type of armament from their Byzantine employers, but also mastered its service and repairing systems if not its production. In any case the presence of a skillful armourer was essential, as it is difficult to assume that ordinary soldiers could repair the damages on such complex armour equipment, whether it be, for instance, rejoining of rows of *lamellae*, their possible rearranging or replacing of the damaged parts...

The activities of the smithy are a segment of all activities undertaken by inhabitants of Early Byzantine Svetinja in order to defend the territories within their responsibility. The course of history, however, inevitably exceeded the defensive potentials of Svetinja and Viminacium; even if armours found on the smithy floor had been in use, on the bodies of warriors, it could not have been defended.

Be this as it may, by the application of precise archaeological methods the final stages of the existence of Early Byzantine Svetinja were reconstructed, and we may say that part of a process of preparation for defense which, however, was futile, has been displayed before our eyes.

So Early Byzantine Svetinja did not persevere, but production of lamellar armour did. Subsequent use of the lamellar type of body armours of Byzantine manufacture has been outlined in this work, as long as it existed until the Late Middle Ages.

⁸⁸ Поповић 1987: 34–35, Сл. 20/5; 24.

⁸⁹ Поповић 1987: 29, 34–35.

⁹⁰ Милошевић 1987: 52, 54, Сл. 16, 17.

BIBLIOGRAPHY:

- Bavant, Ivanišević 2003** – B. Bavant, V. Ivanišević, *Iustiniana Prima – Caričin Grad*, Beograd 2003.
- Bóna 1979** – I. Bóna, A Szegvár Sápoldali lovassír, adatok a korai avar temetkezési szokásokhoz, *Archaeologiai Értesítő 106*, Budapest 1979, 3–32.
- Coulston 1990** – J.C.N. Coulston, Later Roman Armour, 3rd–6th centuries AD, *Journal of Roman Military Equipment Studies 1*, Ryton 1990, 139–160.
- Црнобрња, Крунић 1997** – А. Црнобрња, С. Крунић, Војна опрема и коњска орма, *Античка бронза Синтигунума*, Београд 1997, 263–302.
- Csallány 1933** – D. Csallány, *A Kunszentmártoni avarkori ötvössír*, Szentes 1933.
- Csallány 1956** – D. Csallány, *Archäologische denkmäler der Awarenzeit in Mitteleuropa*, Budapest 1956.
- Csallány 1961** – D. Csallány, *Archäologische denkmäler der Gepiden im Mitteldonaubecken (454–568 u. Z.)*, Budapest 1961.
- Čremošnik 1989** – I. Čremošnik, Rimsko utvrđenje na Gradini u Biograca kod Lištice, *Glasnik Zemaljskog muzeja Bosne i Hercegovine u Sarajevu – arheologija, NS 42/43–1987/1988*, Sarajevo, 1989, 83–128.
- Daim 2003** – F. Daim, Avars and Avar Archaeology – an Introduction, *Regna and Gentes. The relationship between Late Antique and Early Medieval Peoples and Kingdoms in the Transformation of the Roman World*, Leiden – Boston 2003, 463–570.
- Garam 1992** – É. Garam, Die münzdatierten Gräber der Awarenzeit, *Awaren Forschungen, Band 1*, Wien 1992, 135–250.
- Гаврилова 1965** – А. А. Гаврилова, *Могильник Кудрицэ, как источник по истории алтайских племен*, Москва – Ленинград 1965.
- Goldsworthy 2003** – A. Goldsworthy, *The Complete Roman Army*, London 2003.
- Heath, McBride 1979** – I. Heath, A. McBride, *Byzantine armies 886–1118*, London 1979.
- Kiss 2001** – A. Kiss, *Das awarenzeitliche Gräberfeld in Kölked – Feketekapu B, Teil I–II*, Budapest 2001.
- Koch 1977** – U. Koch, *Das Reihengräberfeld bei Schretzheim, teil 1–2*, Berlin 1977.
- Kolias 1988** – T. G. Kolias, *Byzantinische Waffen. Ein Beitrag zur byzantinischen Waffenkunde von den Anfängen bis zur lateinischen Eroberung*, Wien 1988.
- Kory 2004** – R. Kory, Schuppen- und Lamellenpanzer, *Reallexikon der Germanischen Altertumskunde, band 27*, Berlin – New York 2004, 375–403.
- Ковачевић 1977** – Ј. Ковачевић, *Аварски каи-наи*, Београд 1977.
- Кызласов 1981** – Л. Р. Кызласов, Тяхтятская культура древних хакасов, *Степи Евразии в эпоху средневековья*, Москва 1981, 54–59.
- Macdowall, Embleton 1995** – S. Macdowall, G. Embleton, *Late Roman Infantryman, 236–565 AD*, London 1995.
- Mikulčić 2002** – I. Mikulčić, *Spätantike und Frühbyzantinische Befestigungen in Nordmakedonien*, München 2002.
- Милинковић 1998** – М. Милинковић, *Германска племена на Балкану. Археолошки налази из времена Сеобе народа*, Doctoral dissertation, Faculty of Philosophy, Belgrade 1998.
- Милинковић 1999** – М. Милинковић, Рановизантијско утврђење код Бреговине, *Прокупље у праисторији, антици и средњем веку*, Прокупље – Београд 1999, 87–116.
- Milinković 2001** – M. Milinković, Die byzantinische Höhenanlage auf der Jelica in Serbien – ein Beispiel aus dem nördlichen Illyricum des 6. Jh. *Старинар LI*, Beograd 2001, 71–133.
- Милошевић 1987** – Г. Милошевић, Рановизантијска архитектура на Светињи у Костолцу, *Старинар XXXVIII*, Београд 1987, 39–58.
- Mrkobrad 1980** – D. Mrkobrad, *Arheološki nalazi seobe naroda u Jugoslaviji*, Beograd 1980.
- Nagy 1971** – S. Nagy, Некропола из раног средњег века у циглани Полет у Врбасу, *Раг војвођанских музеја 20*, Нови Сад 1971, 187–268.
- Nagy 1998** – M. Nagy, *Awarenzeitliche Gräberfelder im Stadtgebiet von Budapest, Teil I–II*, Budapest 1998.
- Nicolle 1999** – D. Nicolle, *Arms and Armour of the Crusading Era, 1050–1350. Islam, Eastern Europe and Asia*, London – Pennsylvania 1999.
- Nicolle 1999a** – D. Nicolle, *Medieval Warfare Source Book. Warfare in Western Christendom*, London 1999.
- Nikolić, Pop-Lazić 2005** – S. Nikolić, S. Pop-Lazić, Ostaci antičke urabne zone na Dunavskoj padini, *Sintidunum IV*, Beograd 2005, 7–43.
- Od Rimljanov do Slovanov 2001** – *Od Rimljanov do Slovanov. Predmeti* (ur. P. Bitenc, T. Knific), Ljubljana 2001.

Paulsen 1967 – P. Paulsen, *Alamannische Adelsgräber von Niederstotzingen*, Stuttgart 1967.

Pohl 1998 – W. Pohl, Telling the Difference: Signs of Ethnic Identity, *Strategies of Distinction – The Construction of Ethnic Communities, 300–800*, Leiden – Boston – Köln 1998, 17–69.

Поповић 1987 – М. Поповић, Светиња, нови подаци о рановизантијском Виминацијуму, *Старинар XXXVIII*, Београд 1987, 1–37.

Поповић 1999 – М. Поповић, *Tvrđava Ras*, Београд 1999.

Поповић, Иванишевић 1988 – М. Поповић, В. Иванишевић, Град Браничево у средњем веку, *Старинар XXXIX*, Београд 1988, 125–179.

Ricz 1983 – P. Ricz, The Weapons of Steppe Nomads, *Balkanoslavica 10*, Prilep – Београд 1983, 1–15.

Rosner 1999 – G. Rosner, *Das awarenzeitliche Gräberfeld in Szekszárd – Bogayiszlói Strasse*, Budapest 1999.

Southern, Ramsey-Dixon 2000 – P. Southern, K. Ramsey-Dixon, *The Late Roman Army*, London 2000.

Шпехар 2004 – П. Шпехар, *Материјална култура рановизантијских утврђења на простору Београда*, MA thesis, Faculty of Philosophy, Belgrade 2004.

Tettamanti 2000 – S. Tettamanti, *Das awarenzeitliche Gräberfeld in Vác – Kavicsbánya*, Budapest 2000.

Uenze 1992 – S. Uenze, *Die spätantiken Befestigungen von Sadovec (Bulgarien). Ergebnisse der deutsch – bulgarisch – österreichischen Ausgrabungen 1934–1937*, München 1992.

Vinski 1958 – Z. Vinski, О налазима 6. и 7. столјећа у Југославији са посебним обзиром на оставшину из времена првог аварског кганата, *Opuscula Archaeologica III*, Zagreb 1958, 3–57.

Vinski 1982 – Z. Vinski, Šljem epohe Seobe naroda nađen u Sinju, *Starohrvatska prosvjeta III/12*, Split 1982, 7–32.

Въжарова 1976 – Ж. Н. Въжарова, *Славяни и Прабългари, по данни на некрополиите от VI–XI в. на територията на Българија*, София 1976.

Werner 1988 – J. Werner, Adelsgräber von Niederstotzingen bei Ulm und von Bockhondong in Südkorea, Jenseitsvorstellungen vor Rezeption von Christentum und Buddhismus im Lichte vergleichender Archäologie, *Abhandlungen Bayerische Akademie der Wissenschaften Philosophisch-Historische Klasse, N.F. heft 100*, München 1988, 3–20.

Резиме:

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ПРИЛОГ ПРОУЧАВАЊУ ЛАМЕЛАРНИХ ОКЛОПА

Рад се темељи на налазима ламеларних оклопа са виминацијумског локалитета Светиња, којима је већ посвећена пажња у тексту М. Поповића о том рановизантијском локалитету. Налази два оклопа, прецизније њихових очигледно неспојених ламелних низова, односно ламела, потичу са пода објекта који је дефинисан као ковачница. Уз њих је, уз простор око куће 2, пронађен мањи број ламела још једног оклопа.

Гвоздене плочице су знатно кородирание и стога не пружају све податке које би боље очувани комади могли дати. Ипак, један од два оклопа са пода ковачнице је у бољем стању, те је било могуће извршити одређене анализе, односно поређења са најбоље очуваним оваквим оклопом, са некрополе из Нидерштоцингена, којег је објавио П. Паулсен.

Израчунато је да се боље очувани оклоп састојао од око 553 ламеле. До овог броја се дошло сабирањем броја очуваних ламела и количника укупне висине фрагмената и просечне висине једне ламеле. Међу плочицама је било оних три величине: најмање, висине 7 cm, су највероватније биле смештане у раменом појасу оклопа, и у бројчаном су односу од 1:4 у односу на веће ламеле, висине 8,5 cm, које су покривале грудни, stomачни и леђни предео. Најмањи број ламела – свега две комплетно сачуване – је већих димензија, висине 10,5 cm. Оне су у потпуности налик на представнике типа 3 по Паулсену. Једна од тих плочица је и најбоље очувана ламела оклопа, масе од 15,25 g.

Готово све плочице су по средини полукружно или лучно засечене; све су зарубљених углова и перфориране. Кроз перфорације различитог распореда је вршено пришивање ламела, како међусобно, тако и за поставу.

Свођењем пропорције масе и површине најбоље очуване ламеле са укупном претпостављеном површином ламела, израчунатом путем производа процењеног броја ламела и просечне површине једне, од 14,4 cm² (просечне димензије једне плочице су 8 cm x 1,8 cm), израчунато је да су све ламеле тежиле 5,78 kg. Ова маса не представља изворну масу оклопа, јер недостају копче које су спајале ламелне низове, али јој је засигурно блиска. Тако смо закључили да је тежина оклопа са Светиње била мања од вредности које се наводе у литератури.

Укупна површина ламела, такође, није једнака оклопној површини, будући да су ламелни оклопи склапани од хоризонталних низова ламела у којима су се оне међусобно преклапале за око 40%. Тако је оклопна површина боље очуваног налаза са Светиње 4778 cm², што је 60% укупне површине свих појединачних ламела.

Према моделу са Нидерштоцингена, претпоставили смо да су се и низови нашег оклопа састојали од око 32 међусобно преклопљене плочице, ширине до 35 cm. Тако се дало израчунати да је оклоп са Светиње био компонован од 17 низова. За неке од њих смо били у могућности да предложимо реконструкцију. Ових 17 низова је било опшивено кожним опутама, што је потврђено и другде. Низови су потом заши-

вани на уобичајену кожно поставу, коју је у траговима сачувала корозија, преклапајући се одоздо нагоре.

Сличан је, али не и исти, и други оклоп са пода ковачнице, који је пронађен у далеко лошијем стању. У гомилама слепљених ламела је ипак било могуће констатовати и плочице димензија до 7,5 cm x 1,5 cm, са двоструким континуираним лучним засеком изведеним по половини једне дуже стране, какве не познаје Паулсенова типологија. Истиче се и ламела димензија 7,5 cm x 1,5 cm, без лучних засека. Уз њих, констатоване су веће ламеле које одговарају поменутих највећим ламелама са боље очуваног оклопа, односно Паулсеновом типу 3.

Уз уважавање специфичности примерака са Светиње, њих је ипак лако повезати са ламеларним оклопима какви се у византијској употреби јављају у VI веку. Овакав тип оклопа, иначе дубоке генезе и источног порекла, Византинци тада преузимају услед промене начина вођења битака, где се све више користе далекометни рефлексни лукови и пробојне тробридне стреле, такође источног порекла. У германску и аварску употребу овакви оклопи углавном улазе у завршном периоду VI века на почетку VII века.

Налази са пода ковачнице са Светиње су у потпуности прецизно датовани, у крај VI века, у хоризонт између два аварска рушења Виминацијума, оног из 584. године и коначног, које се догодило у неком тренутку од 593–596. године. Они се поуздано могу приписати гепидској војној посади у ранијем нападу већ оштећеног бедема овог локалитета. Тако је контекст налаза са Светиње двојак, будући да су гепидски федерати ове оклопе користили у својству припадника византијске војске, плански уклопљених у одбрамбеној стратегији ове области.

Не чини се да су оклопи пронађени на Светињи ту и прављени. Најпре, није вероватно да би византијска управа дозволила постојање оружарског центра на овом узбуркном подручју. Уз то, ни објекат малих димензија – око 3 m x 3 m – дефинисан као ковачница не може представљати оружарску официну. Оклопи пронађени у ковачници су од различитих ламела, што је такође не намеће за место њихове израде. Тако се пре чини да је у ковачници за потребе војне посаде радио оружар који је оружје поправљао, а не правио.

За ламелне оклопе са Светиње су понуђене аналогije из рановизантијског контекста, али и других окружења, уз напомену да је по први пут опширније скренута пажња на налаз из Селенче. Из раноаварског гроба (?) са овог локалитета потичу разни интересантни налази, међу којима и неколико фрагментованих ламела, израђених од бронзе, како се наводи у документацији Музеја Војводине где се налази чувају. Нажалост, нисмо били у прилици да видимо налазе, али јесмо у прилици да објавимо прибављене цртеже.

Потакнути налазом такође бронзаних оклопних плочица са виминацијумског локалитета Ланци (Рудине), а које смо, уз ограду, приписали старијем римском типу оклопа,

типу *lorica squamata*, сажето смо представили и тај тип дефанзивног оружја, уз наглашавање сличности и разлика у односу на позније, ламеларне оклопе.

Оба ова типа су дубоких источних корена. Археолошка и поготово иконографска евиденција је богата. У раду смо се у том смислу нешто више задржали на налазу ламелног шлема са, опет, Нидерштоцингена, и његовом територијал-

но удаљеном али хронолошки блиском аналогијом из Бокхондонга, из Јужне Кореје, као и на налазу телесног оклопа из гепидског гроба са некрополе Келкед–Фекетекапу В, на којој је германско становништво сахрањивано остајући у територијалном залеђу аварског Каганата.

У раду је дотакнуто коришћење ламеларних оклопа и у каснијим вековима, не само у византијском контексту.