# METHODS FOR AUTHENTICATING ANCIENT BRONZE COINS: A CASE STUDY OF CONSTANTINE'S "PANNONIAN CAP" COIN

In October 2003, a unique coin featuring the Roman emperor Constantine I appeared on the Yahoo Internet auction site and immediately sparked a flurry of heated discussion on Internet fora <sup>1</sup>. The coin was acquired by one of us (ZB), who published it on his Internet site <sup>2</sup>. It was soon examined by leading numismatists and it was regarded as authentic by some experts <sup>3</sup>, but denounced by others. This coin has ever since remained a focus of controversy <sup>4</sup>. The reason is the headdress worn by Constantine on the coin, a type generally regarded as a Pannonian cap. There are no other occurrences on coins or in art of Constantine wearing this headdress. This feature has given rise to continuing speculations regarding the coin's authenticity. Our paper aims at finally resolving the ques-

<sup>3</sup> David Sear issued a Certificate of Authenticity on Nov 18, 2003 and wrote: *after* careful examination of this coin, I really do not see sufficient evidence of alteration to lead me to believe that it has been modified from a more conventional type. Therefore, I feel comfortable in accepting it as the first numismatic depiction of the curious Pannonian cap regalia on an imperial portrait.

Curtis Clay of Harlan J. Berk Coins wrote on Moneta-L, Apr 28, 2005: I have no doubt that it is an authentic untooled original! I had the coin in hand, examined it carefully under magnifying glass and binocular microscope, and even, with Zach's permission, used my scalpel to remove some deposits from around the letters of the legend on both sides. It is beyond doubt, in my opinion, that the deposits and patination on the coin are authentic and that the obverse legend is entirely untooled and original.

<sup>4</sup> 2007: http://www.forumancientcoins.com/board/index.php?topic=34975.0;

2008-2014: http://forum.tpzn.pl/index.php?PHPSESSID=67c2560da781d1f25e8e1d 358c6b4c1a&topic=430.0;

2010: http://www.ancients.info/forums/showthread.php?t=2882;

2013: http://www.lateromanbronzecoinforum.com/index.php?topic=349.0;

2014: http://www.lateromanbronzecoinforum.com/index.php?topic=571.0;

In addition, Yahoo group Moneta-L https://groups.yahoo.com/neo/groups/Moneta-L has over 100 posts on this coin since 2003.

<sup>&</sup>lt;sup>1</sup> 2003: http://www.forumancientcoins.com/board/index.php?topic=5771.0,

<sup>2004:</sup> http://www.ancients.info/forums/showthread.php?t=64

<sup>&</sup>lt;sup>2</sup> http://www.beastcoins.com/Topical/VLPP/VLPP.htm



Fig 1. Bronze coin herein called the Cap coin. A: obverse. B: reverse. Maximum diameter 19.0mm. Dry surface photograph. ZB collection.

Сл 1. Бронзани новчић тзв. Новчић са капом Bronze coin herein called the Cap coin. А: аверс. В: реверс. Пречник 19mm. Фотографија на сувој површини. ZB колекција.



Fig 2. Standard types of VLPP coins from Siscia, all from officina Γ. A, B: RIC 54, Beastcoins website, http://www.beastcoins.com/Topical/VLPP/Coins/Siscia/VLPP-Siscia. htm, A, 2.93g, B, 3.79g,18mm. C, D: RIC 55, Victor Clark's website, http://www.constantinethegreatcoins.com/sis/, C, 3.2g; D, 3.5g. All coins are 18mm diameter.

Сл 2. Стандардни типови VLPP новчича из Сисцие, сви из канцеларије Г. A, B: RIC 54, Beastcoins website, http://www.beastcoins.com/Topical/VLPP/Coins/Siscia/VLPP-Siscia.htm, A, 2.93g, B, 3.79g,18mm. C, D: RIC 55, Be6 – сајт Виктора Кларка, http:// www.constantinethegreatcoins.com/sis/, C, 3.2g; D, 3.5g. All coins are 18mm diameter.

tion of authenticity of the coin. We will discuss methods assisting in evaluating authenticity in ancient bronze coins. We will also provide a discussion of the Pannonian cap, and discuss if that is what Constantine is wearing on the coin. To avoid ambiguity, the coin will be referred to hereafter as either the Cap coin or the 2003 coin.

In order to evaluate the authenticity of the coin, we have used the following methods:

- High magnification stereoscopic study to identify patina, corrosion, deposits, tooling, and for searching for indications of casting and other metods of forgery <sup>5</sup>.

- Iconographical analysis of individual elements such as letters, features of bust, altar and Victories.

- Identification of individual characteristics of the die-engraver/s.
- Die matching.

- Physical probing of patina and deposits with sharp instruments.

- Dry and wet study and photography, including dry photography in reflected and low-angle natural and artificial light.

- Alloy analysis study using energy dispersive X-ray spectroscopy (XEDS).

- Radiographic study using micro-CT scanning.

Micro-CT scanning and stereoscopic wet study are used here for the first time on an ancient bronze coin. To our knowledge, no single coin has ever before been subjected to such rigorous analysis.

#### Description of the coin

The weight of the Cap coin is 3.27g, the maximum diameter is 19.0mm, and the die axis is 6 o'clock (Fig. 1). The coin is thus within standard size and weight 6 for the bronze issues produced at the time. The obverse legend (as discussed later on) is IMP CONSTANTINVS PERT AVG, with two breaks: CON-STANT-INVS. The bust may be described as "Draped bust r., with pillbox-shaped cap". Constantine wears a paludamentum. The reverse carries the legend VICTORIAE LAETAE PRINC PERP (herein VLPP), and shows two Victories holding a shield inscribed VOT/PR over a rectangular altar with corners connected by diagonal lines with an added '+' (plus) where the lines intersect. A horisontal line separates the design from the exergue, which carries the mint mark  $\Gamma$ SIS.

### Position of the coin in the Siscia coinage

The VLPP coins were minted exclusively under the Roman emperor Constantine I, between 313 and 320 CE <sup>7</sup>. The mint mark in the exergue of the

<sup>&</sup>lt;sup>5</sup> See e.g. Propokov & Manov 2005; Ramskold 2009.

<sup>&</sup>lt;sup>6</sup> Bruun 1966, p. 9.

<sup>&</sup>lt;sup>7</sup> See Victor Clark's detailed info on http://www.constantinethegreatcoins.com/sis/



Fig 3. Three very similar reverse dies from Siscia officina Γ showing the position of the Cap coin in the Siscia coinage. A, B: RIC Siscia 52. C: Cap coin. Lower register shows details of reverses. Note large shields, presence of wreath ties below shield, details of altar design and of Victories. A. Victor's Imperial Coins, 3.3g. B, Marti Hervera, Barcelona, Spain, Auction 67 (2011), one of 6 coins in lot 2777.

Fig 3. Три слична реверса из Сисцие, канцеларије Г који показују положај новчића са капом у ковници Сисциа. А, В: RIC Сисциа 52. С: Новчић са представом капе. Доњи регистар приказује детаље реверса. Приметни су велики штитови, присуство венца испод штита, детаља олтара и Викторије. Царски новчићи из колекције А. Виктора, 3.3g. В, Марти Ервера, Барселона, Шпанија, Аукција 67 (2011), један од 6новчића од укупно 2777.

reverse of the Cap coin reads  $\Gamma$ SIS, meaning the third officina (workshop) of the imperial mint at Siscia. The altar carries design 'y' of Bruun (a diagonal cross with a + over the centre) <sup>8</sup>. The mint mark indicates that the coin should belong to the issue "ASIS "of Bruun <sup>9</sup>, dated by him to 318-319 (Fig. 2).

In this issue there are some remarkable coins, exclusively from officina  $\Gamma$ , showing that for a short time, the engraver/s of that workshop could produce ex-

- <sup>8</sup> Bruun 1966, pp. 460-61, Appendix.
- <sup>9</sup> Bruun 1966, pp. 431-32, no. 52-58.

traordinary coins <sup>10</sup>. We have no way of telling if this was officially sanctioned, but the coins were not rejected and remelted since we know that they entered circulation. Extraordinary coins from the "ASIS" issue are:

**RIC VII Siscia 52.** This type is unique among the numerous types of the VLPP coins from Siscia in showing the obverse legend IMP CONSTANTINVS MAX AVG. It was listed by Bruun as known from a single example from officina  $\Gamma$ . The coin was found in the Nagytétény hoard <sup>11</sup>, so we know that it entered circulation. Since then, two more examples have surfaced, also from officina  $\Gamma$  <sup>12</sup>. Interestingly, the reverses of these are exceedingly similar to that of the Cap coin (Fig. 3). Detailed, unique similarities include the large shield, the wreath ties under the shield, the shape and position of the Victories, and the shape and design of the altar. It is unavoidable to conclude that these reverse dies were all engraved by the same person, and within a very short time span.

**RIC VII Siscia 56.** The obverse of this type is H<sup>12</sup> l of Bruun 1966 <sup>13</sup>. Bruun knew of only one coin from officina  $\Gamma$  <sup>14</sup>. Two additional coins from officina  $\Gamma$  show decorated shields. The first shows a shield with a 'flower' design <sup>15</sup> (Fig. 4A) which is most unusual in Siscia VLPP coins. The second exceptional coin coin shows a rider charging over an undulating line which may be purely decorative or perhaps indicates water (Fig. 4B). There are other VLPP coins from Siscia showing a rider on the shield, but they differ in always showing a fallen enemy on the ground under the horse, and never an undulating line. Interestingly, the reverse of this coin is a die match with a coin with the "normal" obverse D<sup>6</sup> (Fig. 4C). In common with the other coins discussed here, both coins have a reverse with the altar design 'y'.

Yet another unique obverse, also from officina  $\Gamma$ , from the RIC VII Siscia 52-58 issue is known from two examples <sup>16</sup>, struck from the same obverse die but different reverse dies. They have bust H<sup>6</sup>, which is otherwise unknown from the VLPP issues of Siscia. The reverses have altar design 'y' and are similar to the other exceptional officina  $\Gamma$  coins described here.

The Cap coin fits well with the above coins. The reverse die similarities show unequivocally that it belongs with the RIC 52 examples, and the unique obverse is spectacular but fits into this group of other unique obverses.

<sup>&</sup>lt;sup>10</sup> In the subsequent issue, also officina B produced some extraordinary coins, notable the two well-known varieties with Chi-Rho helmet (RIC VII Siscia 61).

<sup>&</sup>lt;sup>11</sup> Described by Alföldi 1921.

<sup>&</sup>lt;sup>12</sup> Victor's Imperial Coins website; Marti Hervera, Barcelona, Spain, Auction 67 (2011), one of 6 coins in lot 2777. Sales data indicate that the latter coin may have been found in Spain.

<sup>&</sup>lt;sup>13</sup> High-crested helmet, cuir., spear across r. shoulder, shield on l. arm

<sup>&</sup>lt;sup>14</sup> Reverse altar design listed as 'x' but is probably the very similar 'y'.

<sup>&</sup>lt;sup>15</sup> RIC VII Siscia 56 with flower design on shield. Ebay seller ID nerva4, 15 June 2003, no. 3029546096, 3.29g. Sales data indicate that the coin may have been found in Spain.

<sup>&</sup>lt;sup>16</sup> ZB website: http://www.beastcoins.com/Topical/VLPP/Coins/Siscia/ConstantineI-RICVII-NIR-gSIS-53v-H6.jpg ; Victor Clark, listed between RIC 54 and RIC 55 on http://www.constantinethegreatcoins.com/sis/.



Fig 4. Exceptional VLPP coins from Siscia officina Γ. A: RIC 56 with flower design on shield. Ebay seller ID nerva4, 15 June 2003, no. 3029546096, 3.29g. B: RIC 56 with unique horserider on shield. Münzen & Medaillen GmbH Auktion 39 (2013), lot 249. 3.70g. C: normal RIC 54, note die match of reverse with reverse B.

Сл. 4. VLPP новчићи из сисцие, канцеларија Г. А: RIC 56 са цветним орнаментом на штиту. Евау продавац ID 4, 15 Јун 2003,бр. 3029546096, 3.29g. В: RIC 56 са јединственом представом коњаника на штиту. Münzen & Medaillen GmbH Auktion 39 (2013), lot 249. 3.70g. С: RIC 54, приметити поклапање пречника реверса са реверсом В.

#### Preservation

We have carefully examined the Cap coin at high magnification under a stereo microscope. LR has examined the surface both dry and wet, and examined the character (hardness, homogeneity, colour) of deposits and corrosion with the tip of a surgical scalpel. We have found no indications that the coin is a modern production.

**Tooling.** The Cap coin shows a multitude of traces of cleaning (such as many faint scratches) and tooling. In addition to general cleaning and smoothing, a trench has been carved along the cap's edge, presumably to enhance the contour. In general, the trench follows the cap's edge closely, but along the forehead and nose, the trench stops just short of the raised edge, so that a double contour is formed <sup>17</sup> (Fig. 5). Parts of several letters were lost to the trench: the lower parts of the N in CON and the last T in STANT, and the lower part of all letters in INV (Fig. 6). On the edge of the coin, there is an area which has been scraped deeply with a hard tool (Fig. 7A). The scraped area shows exposed metal with the appearance of copper.

<sup>&</sup>lt;sup>17</sup> We emphasize that this feature is not the result of a double strike.



- Fig. 5. Detail of Cap coin showing tooling along cap resulting in a double contour. Dry surface. Width of area shown is 11.15mm. Cut-out detail is 1.65 x 3.25mm.
- Сл. 5. Детаљ новчића са капом, где се види и двострука контура. Сува површина. Ширина површине је 11.15мм. Исечак је димензија 1.65 x 3.25mm.



Fig. 6. Detail of Cap coin showing how tooling along cap resulted in the loss of parts of letters in the legend. Wet surface. A: Surface tooled smooth from cap's edge to legend. B: Reconstruction of letters with lost parts reconstructed in solid white. Height of area shown is 6.35mm.

Сл. 6. Детаљ новчића са капом који показује и делове слова у легенди. Сува површина. А: Углачана површина од ивице капе до легенде). В: Реконструкција слова са реконструисаним изгубљеним деловима слова. Висина приказаног дела је 6.35mm.



Fig. 7. Edge of Cap coin. A: scraped area showing exposed metal with the appearance of copper. Length of area shown 2.35mm. B: A lump of concretions, at 10 o'clock of the obverse, embedding a quartz grain about 0.30mm wide (circled). Length of area shown 2.20mm.

Сл. 7. Ивица новчића са капом. А: шрафиран део показује изложен метал уз делове бакра. Дужина приказаног дела је 2.35mm. В: грумен камена, у правцу 10 сати на аверсу 10, уграђено кварцно зрно 0.30мм ширине. Дужина приказане површине је 2.20mm.

**Deposits.** In spite of the heavy cleaning and carving, several areas of encrustations remain (presumably, such deposits covered most of the coin prior to cleaning). These cannot have been artificially applied since they are seen in high magnification to intergrate seamlessly into the patina and corroded surface of the coin proper. On the coin's edge are some lumps of such concretions, the largest of which (at 10 o'clock of the obverse) includes a quartz grain about 0.3mm wide (Fig. 7B). Such quartz grains, embedded in the concretions, are commonly seen on coins found in many areas including the Balkans. We know of no examples of similar encrustations produced artificially, nor are we aware of any artificial method that would produce such encrustations (we have seen many types of fake patina and fake deposits, but they are all easily distinguishable under the stereo microscope or revealed when solvents are applied).

Mineral deposits of unknown chemical composition <sup>18</sup> are seen in furrows and other depressed and protected areas. The deposits are especially widespread on the hat and in the hair, where every sunken area is filled with such material. These deposits are almost invisible when the coin is dry, but they come out very clearly when the coin is immersed in liquids such as ethanol or petrol (Fig. 8). The deposits then appear nearly black, and by this, the detailed surface pattern of the cap is revealed as is each engraved strand of hair. When cut into with the tip of a scalpel blade, these deposits have a homogenous structure and have the hardness of carbonate deposits common on ancient bronze coins.

There are also small patches of verdigris (a mixture mainly of copper salts) scattered over the coin.

**Silvering.** We assume that the coin originally must have been silvered, like all bronze coins at the time. Today, there is no silvered area preserved. There are small specks of shiny material embedded in the corroded surface, and from analogy with other coins showing similar structures, these are possibly remains of the silvering (see also XEDS analysis below).

 $<sup>^{18}\,</sup>$  Similar deposits in other coins showing the same type of preservation usually include different carbonates.



Fig. 8. Cap coin, obverse, wet surface photography. A: entire obverse, showing extent of copper salt deposits (black). B: Detail showing how the deposits in recessed areas reveal the detailed surface structure of the hat and of the hair.

Сл. 8. Новчић сакапом, аверс, фотографија на сувој површини. А: цео аверс, приказује депозите бакарних соли (црно). В: детаљ који приказује депозите соли и детаљну структуру капе и косе.

**Corrosion.** Seen at high magnification under a stereo microscope, there is no sharp boundary between the coin and patina and encrustations. The metal grades irregularly into corrosion products. For this reason, the exact topology of the original surface is difficult to see and sometimes it is impossible to ascertain where the coin ends and the deposits begin. This is especially so when it comes to protruding parts such as the letters in the legends. We have tackled this problem by using micro-CT scanning (see below).

To summarize, several of the above features indicate that the coin is ancient, especially the different types of encrustations and the corrosion grading into metal.

## Radiographic analyses using XEDS and micro-CT scanning 19

Three specific questions regarding the authenticity of this coin were considered especially amenable to the two modes of investigation used here. These are: 1.) Is the hat a later addition <sup>20</sup> to an otherwise authentic coin, specifically produced to deceive? 2.) Is the metal composition of the coin consistent with

<sup>&</sup>lt;sup>19</sup> These analyses were carried out by RB at the Department of Radiology, University of Michigan, USA.

<sup>&</sup>lt;sup>20</sup> The cap could not have been artificially produced by re-carving an original VLPP coin as it is too high above the surface and too large to have been produced that way. It could only have been artificially produced by building up or adding the material of the cap onto an original coin, and 'later addition' refers to that method of production. This added material could have been metal or non-metallic, such as hard wax, polymer, or inorganic substances.

that of the ancient alloy used for the VLPP coinage? 3.) Is the 'PERT' portion of the obverse legend original, or was the legend originally something else and one or more letters were altered or created by exuberant cleaning or overt tooling?

The specific methods of investigation used to address these issues are next described. Then it will be shown how these methods answer the preceding questions and what this information means.

Energy dispersive X-ray spectroscopy (XEDS) was used to determine the composition of the metal alloy of the hat as well as an area away from the hat (inside the deepest portion of the ear). It was performed with an electron microscope by first using a beam of gallium ions to bore a tiny hole through the patina down to virgin metal, and then using a beam of electrons to analyze the underlying metal <sup>21</sup>. This was done so that the composition of the original metal, and not the altered composition of the overlying oxidation products (patina), would be obtained. The holes were very tiny and rectangular <sup>22</sup>, approximately eight by ten microns on the sides and four microns deep. The results follow (Table 1).

	% Copper	% Silver	% Lead	% Tin
Сар	94.5	2.0	2.0	1.0
Ear	93.0	1.5	4.0	1.0

Table 1. Compositions of the two analyzed sites using XEDS. Percentages are in weight percent <sup>23</sup>.

Within the limits of experimental error for the XEDS technique, these two compositions are the same, and show that the metal of the cap is the same composition as that of the metal away from the cap. In addition, the amount of silver (the most important alloy constituent) is within the range of that encountered in authentic VLPP coins from the mints which produced this type <sup>24</sup>.

Next, micro-CT scanning of the coin was performed <sup>25</sup>. A representative section of the coin is shown in Figs. 9B, C, photographed at two different con-

<sup>&</sup>lt;sup>21</sup> A detailed description of XEDS is beyond the scope of this work. Briefly, it works by detecting the X-rays emitted when a beam of electrons interacts with the electrons in the sample, because each element emits X-rays of characteristic energies. These detected X-rays tell not only the elements in the sample, but how much of each element is present in relation to the other elements in the sample, with the results expressed in weight percentages.

<sup>&</sup>lt;sup>22</sup> It was far too small to be seen with the naked eye, requiring fairly high magnification to be visible, and therefore did not alter the coin in any significant way.

 $<sup>^{23}</sup>$  These compositions do not add up to exactly 100 percent. This is because there were trace elements in the sample which were present in concentrations too small to be important, so they are not included here.

<sup>&</sup>lt;sup>24</sup> Cope et al. (1997, pp. 44-45) stated that the average silver content in 14 coins from the mints of Siscia, London, Trier, Lugdunum, Arles, and Ticinum was 3.92%, with a range of 1.27-5.26%, and with the silver content of the only specimen from Siscia measuring 3.35 %.

<sup>&</sup>lt;sup>25</sup> Micro-CT scanning works exactly like human CT scanning. Although the principles of the technique are too complicated for a detailed explanation in a work of this scope, micro-CT scanning works by rotating an X-ray tube around the coin and detecting the X-rays that pass through it as the X-ray tube rotates. By analysing the transmitted X-rays with



Fig. 9. Micro-CT scan of Cap coin. One of the more than 2000 original slices, obtained perpendicular to the surface of the coin and positioned through the hat (white line in A), displayed at high contrast (B) and low contrast (C) settings. There is no evidence of any junction where the metal of the hat (denoted by arrows) joins the remainder of the coin. If solder or adhesive had been used to adhere a fake hat to the body of the coin, a zone of a different shade of grey than the bulk of the coin would be present where this material was located. If a metal of substantially different alloy content than the remainder of the coin, or if a non-metallic material had been used to construct the hat, it would be a different shade of grey than the remainder of the coin.

Сл. 9. Микро-СТ скен новчића сакапом. Један од више од укупно 2000, према површини новчића и скен кроз површину капе (бела линија у А), приказани контраст (В) и слабији контраст (С). Нема показатеља везе између метала капе (означеног стрелицама) и остатка новчића. Услучају да је реч о лажном новчићу тј. накнадно изведеној капи, појављивала би се светло сива сенка. Да је реч о другачијем металу у односу на остатак новчића, појављивала би се другачија сенка у односу на остатак новчића.

trast settings. This slice is through the cap (the raised surface at the top of the image; for position of section see Fig. 9A) and shows that there is no detectable junction or area of joining, nor is there evidence of solder or other adhesive, where the metal of the cap meets the rest of the coin. Additionally, the cap has not been artificially produced by the addition of non-metallic material, as non-metallic material would show up either as an area much darker or perhaps lighter than metal, and not of exactly the same shade of grey as is the case in this coin  $^{26}$ .

Lastly, the entire set, or stack, of more than 2000 contiguous CT slices was then processed by computer software to produce cross-sectional images parallel to the face of the coin without loss of resolution. A representative slice of the coin produced by this technique is illustrated in Fig. 10. These slices were only 10 microns thick. Twenty-two of these slices were reconstructed specifically selected to sequence through the 'PERT' portion of the obverse legend, beginning at the very superficial edges of the letters and proceeding into the coin until the letters merged with the surface of the coin. Six of these twenty two

sophisticated computer software, detailed cross-sectional images of the coin are obtained. The entire coin was scanned with a contiguous stack of extremely thin, 9 micron thick, cross-sectional slices perpendicular to its face; a representative slice is shown in Fig 10.

<sup>&</sup>lt;sup>26</sup> Again, the underlying physics is too complicated for this discussion, but the types of non-metals with which a fake cap could be constructed would not have the same electron density, and thus would not have the same shade of grey, as the copper alloy of this coin.



Fig. 10. Representative reformatted slice of the Cap coin, ten microns thick, parallel to the surface of the coin showing the face and the right legend at that level. X 4.

Сл. 10. Репрезентативан узорак новчића са капом, дебљина 10 микрона, уз површину новчића приказано је лице као и легенда на нивоу X 4.

images, selected at 40 micron (0.04 mm) spacings <sup>27</sup>, are shown as a composite image (Fig. 11). They show that none of the letters of 'PERT' were altered from the original, either by altering a letter (for instance, changing an 'R' to a 'P' or a 'P' to a 'T'), or by totally removing a letter down to surface metal and then producing another letter by engraving into the surface of the coin <sup>28</sup>, because no alteration of the letters is identified. This portion of the legend is now as it was when it was produced: 'PERT'. The significance of the legend will be discussed elsewhere in this work.

Now that the techniques for analysis have been described and the results have been shown, it is appropriate to summarize the results and to consider their full ramifications. First, the Cap coin is composed of a metal alloy whose composition is fully consistent with that used for authentic VLPP coinage. Second, the cap portion of the coin is metal and is of the same alloy as the rest of the coin. Third, the metal of the bulk of the coin merges imperceptibly into the metal of the cap. There is no evidence of a junction, area of discontinuity, or evidence of solder or adhesive to indicate the metal of the cap was a later addition to the coin. These findings indicate beyond conceivable doubt that the cap was an original feature of the coin and that the coin (note line-through) as it is seen now is virtually as it was when it was produced <sup>29</sup>. Also, since the composition of the alloy of the coin is consistent with that of the ancient alloy used for the production of authentic VLPP coins, this is strong evidence that the

<sup>29</sup> Except for the minimal changes of tooling already described earlier, which occurred when the coin was cleaned, and for the patination which occurred during long burial.

 $<sup>^{27}\,</sup>$  In other words, every fourth section in this stack of 22 images, beginning with the first, is shown.

<sup>&</sup>lt;sup>28</sup> In fact, the entire set of 22 images (not shown) shows that the entire right half of the legend, 'INVSPERTAVG' was without either type of alteration, and was originally produced to read that way.



Fig. 11. Stack of reformatted images through the right side of the legend of the Cap coin. Only every fourth image of the complete set is shown. These images are sequentially oriented from left to right, with the right image the most superficial, obtained at the very tips of the letters, and with the left image the most deep, showing the letters merging into the surface of the coin. These images show that there is no detectable alteration of this portion of the legend, with each letter tapering smoothly into the surface of the coin. (The letters are a little indistinct as they merge into the surface because of remaining patina in crevices and on edges of the letters.)

Сл. 11. Свака четврта слика из комплетног сета слика. Фотографије су оријентисане од леве према десној страни, десно су површније и усмерене према врховима слова, а лево су дубље показујући ширење слова према површини новчића. Нема забележене алтерације, свако слово је изведено уз глатку површину. (Слова се незнатно разликују како се шире према површини а виде се и делови патине на ивицама слова)

coin is of ancient manufacture, and was not produced from readily available pure copper or bronze from the current era. However, from these metallurgical results alone, it is still possible, although unlikely, that the coin could have been recently struck from modern dies <sup>30</sup> using a flan made from melted authentic coins, thus insuring the alloy to be of ancient composition. Such a fake coin would then have to be artificially corroded and patinated. This possibility is unlikely because it presupposes a forger would have taken the care to produce a coin that would eventually be analyzed metallurgically, something which would be unnecessary if a quick one-off sale via the internet were contemplated, as happened with this coin. Nonetheless, this is still a potential criticism, for which the microscopic and stylistic analyses described elsewhere in this work will provide strong evidence to support the overall contention that the coin is ancient and is essentially 'as made', and not a modern fake.

#### Obverse legend

The obverse legend is here confirmed to read IMP CON-STANT-INVS PERT AVG. This legend is unique. PERT is clearly an abbreviation of a longer word or words. PERT is otherwise known in Roman coin legends only as an abbreviation of PERTINAX, as in SEPT SEV *PERT* AVG IMP. In a legend of

 $<sup>^{30}\,\,</sup>$  It is also highly unlikely but not inconceivable that the coin is not struck but cast in modern times.



Fig. 12. The 2012 coin. Gorny & Mosch Aucton 204 (5-6 March 2012), lot 2568. Weight only 1.68g due to corrosion and edge losses. Photos courtesy Lübke & Wiedemann KG, Stuttgart.

Сл. 12. Новчић из 2012. Gorny & Mosch аукција 204 (5-6 Март 2012), бр. 2568. Тежина само 1.68g због корозије и недостатка ивица. Фото: Lübke & Wiedemann KG, Штутгарт.

Constantine, it must have another meaning (unless it is an overt error). Near the end of this paper we discuss a possible reading of PERT (see "A general message" below).

#### The second coin

In 2012, a second, apparently ancient example of a cap coin appeared <sup>31</sup>. This coin shows the same obverse type, but the reverse is struck from a different die and the mint mark appears to indicate that it is from a different officina. This coin has not been available to us for examination, but fortunately the available illustrations are good (Fig. 12). This coin is herefter called the 2012 coin.

This second coin is more corroded and is heavily tooled. In spite of the poorer preservation, a detailed comparison of the obverse of the 2012 coin with that of the 2003 coin shows beyond any doubt that the two obverses were struck from the same die (Fig. 13). This is proven by the exact match of every fine detail in the cap and the strands of hair. It is impossible to explain the perfect match in any other way.

Most of the paludamentum is so corroded that it lacks any detail. The border between the paludamentum and the neck has been carved to show a ridge which does not exist on the 2003 coin and is a creation due to the re-carving.

The obverse legend reads IMP CONSTANTINVS PERP AVG. However, many letters have been heavily tooled. Our micro-CT investigation of the 2003 coin shows beyond doubt that the legend reads PERT. In the 2012 coin, the fourth letter in PERP is in fact a T that has been re-cut into a P.

<sup>&</sup>lt;sup>31</sup> Gorny & Mosch Aucton 204 (5-6 March 2012), lot 2568.



Fig. 13. A-C: The Cap coin. D-F: The 2012 coin. A, D: Upper area of both coins figured at same rotation. The white rectangles show the position of the enlarged details. B, E: Details showing exact agreement between the same selected area (1.40mm x 1.47mm) centrally in the cap in both coins. C, F: Details showing exact agreement between the same selected area (1.04mm x 2.37mm) of the cap and adjacent strands of hair in both coins.

Сл. 13. А-С: Новћић са капом D-F: Новчић из 2012. А, D: Горња површина оба новчића. Бели правоугаоници показују положај увеличаних детаљаВ, Е: Детаљи који приказују тачан однос одабраних делова(1.40мм х 1.47мм) централно н оба новчића С, F: Детаљи означених делова (1.04мм х 2.37мм) капе и делови косе на оба новчића.



Fig. 14. Comparison of altar design in the 2012 coin with altars from two other mints. Each reverse with enlarged altar area below. A: Reverse of 2012 coin. B: Arles RIC 193, Pecunem Auction 32, lot 634. C: London RIC 159, VAuction 316 (Pegasi), lot 648.

Сл. 14. Поређење два новчића. А: Реверс новчића из 2012. В: Arles RIC 193, Ресипет аукција 32, бр. 634. С: London RIC 159, аукција 316 (Pegasi), бр. 648.

The reverse of the 2012 coin is quite different from the 2003 one. The mint mark appears to be ASIS or possibly  $\Delta$ SIS. Either reading means that the coin was produced in a different officina from the 2012 example, which is from officina  $\Gamma$ . Since the obverses of the two coins are die matched, it is most unexpected to find reverses produced in different officinae<sup>32</sup>. However, the officina letter is so heavily tooled that it originally could have been any letter, including  $\Gamma$ , so it cannot be excluded that the mint mark originally was  $\Gamma$ SIS.

Remarkably, not only is the reverse of the 2012 coin struck from a different die, and possibly from a different officina, but it is unlike any VLPP reverse previously known from Siscia. Bruun (1966) listed 29 different altar designs found in Siscia VLPP coins <sup>33</sup>, none of which is similar to the one in the 2012 coin. However, the altar design in this second cap coin is common in VLPP coins struck in Arles and London (Fig. 14). Other features, such as the details of the two Victories, are more variable and are difficult to use for determining the mint of a VLPP coin.

To conclude, the obverse die match of the 2012 coin with the 2003 coin can only be the result of the two coins having been produced from the same

<sup>&</sup>lt;sup>32</sup> There are examples of dies being "borrowed" between officinae during the reign of Constantine, but they are extremely rare (LR, unpublished information).

<sup>&</sup>lt;sup>33</sup> We have also showed the reverse to the Siscia specialist Damir Sucic who states that the reverse is unlike any he has ever seen in a Siscia VLPP coin.

die<sup>34</sup>. This can only mean that the 2012 coin is also ancient. We cannot propose a convincing explanation why the reverse type is unknown from Siscia but typical of Arles and London.

#### *Constantine's outfit*

The Cap coin is unique among VLPP coins from Siscia in showing Constantine wearing a paludamentum, but no cuirass. There is no sign of pterygiae or other indications of a cuirass. All other bust types used for the VLPP coinage of Siscia show military busts: D<sup>2</sup>, D<sup>6</sup>, H<sup>6</sup>, H<sup>11</sup> l, and H<sup>12</sup> l (Fig. 2). On all of these types, Constantine wears a helmet and a cuirass. On the Cap coin, however, he is shown wearing a paludamentum. The Cap coin thus shows Constantine in an attire lacking reference to war.

The headgear worn by Constantine is the most remarkable aspect of the Cap coins. From 2003 until now, this headgear has been identified as a Pannonian cap (or hat). The reason is that similar-looking caps in sculpture and mosaics from Late Roman times have consistently been called Pannonian caps, a type of headgear known as the *pileus Pannonicus* in antiquity. However, this may be an inaccurate usage of the term. We will here discuss the *pileus Pannonicus* and the identity of the cap seen in the Cap coins.

### The Pannonian cap and the pillbox cap in antiquity

**1. The Pannonian cap.** It seems that the modern usage of the term "Pannonian cap", the *pileus Pannonicus*, is based on a single reference from antiquity. The late 4<sup>th</sup> C Roman writer Vegetius wrote <sup>35</sup>:

"Almost down to the present day the custom survived whereby all soldiers wore leathern caps which they called "Pannonians". This was observed so that the helmet should not seem heavy to a man in battle, who was used always to wearing something on his head."<sup>36</sup>

This military leather cap is the *pileus Pannonicus* <sup>37</sup>. For reasons given below, we question if the term can be applied to the pillbox-shaped caps from tetrarchic and later times.

<sup>&</sup>lt;sup>34</sup> We can rule out die transfer and casting from a mold of the 2003 coin because a mold could not reveal the cap surface details, but those details are present in the 2012 coin.

<sup>&</sup>lt;sup>35</sup> Vegetius book I:20. "Usque ad praesentem prope aetatem consuetudo permansit, ut omnes milites pilleis, quos Pannonicos vocabant, ex pellibus uterentur; quod propterea servabatur, ne gravis galea videretur in proelio homini, qui gestabat aliquid semper in capite."

<sup>&</sup>lt;sup>36</sup> Translation N. P. Milner, 1993.

<sup>&</sup>lt;sup>37</sup> Its origin is lost in the mists of time. There have been speculations that the *pileus Pannonicus* had its origin in the Persian tiara or was influenced by it (Sumner 2003, p. 37). We fail to see any similarity in design or usage, and see no historical, geographical, or cultural connections and therefore reject this idea.



Fig. 15. A. Tomb stele for Marcus Aurelius Alexis wearing Pannonian cap. Athens, early 3rd century. National Archaeological Museum, Athens. Photo Giovanni Dall'Orto 2009. B, C: Pannonian cap or pillbox cap from Mons Claudianus, Egypt, c. 100-120 CE. Egyptian Service of Antiquities MC922. B, front view, height is 11 cm.: C: Top view, crown is 19.5 x 13.5 cm. Images courtesy prof. Lise Bender Jørgensen.

Сл. 15. А. Гробна стела Марка Аурелија са панонском капом. Атина, рани 3.век Национални археолошки музеј, Атина. Фото: Ђовани Дел'Орто 2009. В, С: Панонска капа или цилиндрична капа са Монс Клаудианус, приближно 100-120 н.е. Egyptian Service of Antiquities MC922. В, фронтално, висина 11цм.: С: Поглед одозго, круна је 19.5 x 13.5 цм. Фото: проф. Л. Бендер Јоргенсен.

Curiously, in spite of Vegetius's statement, until tetrarchic times Roman soldiers are either depicted wearing a helmet or bare-headed <sup>38</sup>. It is unlikely that a leather cap was worn under the helmet because the helmet already had a leather lining which was firmly attached to its inside <sup>39</sup>.

A single early depiction has been claimed to show the *pileus Pannonicus*: a relief on a tomb stele from Athens, dated to the early 3rd century <sup>40</sup>. The relief shows the deceased Marcus Aurelius Alexis in a soldier's uniform, with sword and shield, wearing a cap (Fig. 15A). We accept that this appears to be the type of leather cap described by Vegetius. The cap is pointed and in our view not very similar to the Late Roman caps identified in modern times as the *pileus Pannonicus*.

**2. The pillbox cap.** We will now present a short survey of ancient depictions of a type of cap that we believe may be related to but not identical with the Pannonian cap. This cap is made of either fur or felt, it is pillbox-shaped, i.e., flat-topped, vertical-sided, and brim-less. We don't know what it was called in antiquity. Most known examples are from around 300-330 CE, although somewhat similar types are known from both earlier <sup>41</sup> and later dates <sup>42</sup>.

<sup>41</sup> The Mons Claudianus cap described herein.

<sup>42</sup> D'Amato and Sumner (2005, p. 23): "Figurative sources of the 5<sup>th</sup> century still confirm the use by soldiers on active service of the cylindrical 'Pannonian' cap, the so-called *pileus pannonicus* mentioned by Vegetius (I, 20), derived from the Persian tiara, this might be of felt or napped wool, smooth or shaggy, low or tall. In the Eastern Empire various terms were used, including *tiara*, and *kamelaukion*, which was used throughout the Byzantine

<sup>&</sup>lt;sup>38</sup> Sumner 2003, p. 36.

<sup>&</sup>lt;sup>39</sup> Sumner 1997, p, 75.

<sup>&</sup>lt;sup>40</sup> National Archaeological Museum, Athens. See Ubl 1976, p. 217, no. 2.1.1, fig. 2; Wikimedia Commons, File:1837.

Amazingly, an example of a Roman felt cap has survived until today (Fig. 15B, C) <sup>43</sup>. Its remains were discovered at Mons Claudianus, a Roman granodiorite quarry in eastern Egypt <sup>44</sup>, and it was described in 2006 <sup>45</sup>. The cap was associated with ostraca allowing it to be dated to 100-120 CE, that is, to the reign of Trajan or possibly early in the reign of Hadrian. The cap is made from wool felted into pillbox shape. The felt is a few millimeters thick. The crown is oval, about 19.5 x 13.5 cm, and the vertical sides reached 11 cm height. The colour is dark green <sup>46</sup>. In Mons Claudianus, the cap must have been worn by workmen or off-duty soldiers <sup>47</sup>. The cap was described as a *pileus Pannonicus* but it is dubious if this type of cap is related to the leather cap described by Vegetius. Its shape is very similar to the cap of tetrarchic and Constantinian times and later, described below as the pillbox cap, and may point to an early development of this type of headgear.

We will now survey known depictions of the pillbox cap.

**Tetrarch group in Venice.** Perhaps the earliest depiction is seen in the famous porphyry group built into the corner of St Mark's basilica in Venice <sup>48</sup>. The sculptures are generally dated to c. 300 CE. The group shows four tetrarchs <sup>49</sup>, all wearing pillbox-shaped caps (Fig. 16). Apart from the caps, the tetrarchs wear the normal attire for showing military capacity: a mantle over a cuirass, and an eagle-headed sword attached to the belt. This is standard attire for an emperor and is not necessarily a wartime representation.

Each cap has a central hole in the front. This has been thought to show where originally a gemstone may have been attached. The 4th C historian Eutropius wrote (Book 9:26):

<sup>45</sup> Mannering 2006, p. 153 ff, fig. 3. The cap is also figured and discussed by D'Amato & Sumner 2009, p. 218, fig. 309.

<sup>46</sup> Natural Colour System code S7020 G30Y. This is likely the original colour (Prof. Jørgensen pers.com. 12 Jan 2015).

<sup>49</sup> Completely idealised, probably representing the two augusti Diocletian and Maximianus, and the two caesars Constantius and Galerius.

period for hats in general."

<sup>&</sup>lt;sup>43</sup> The cap, numbered MC922, is housed in a storage facility in Qift belonging to the Egyptian Service of Antiquities. We thank prof. Lise Bender Jørgensen for kindly supplying this and other information concerning the cap.

<sup>&</sup>lt;sup>44</sup> See Bülow-Jacobsen 1996. The quarry provided this hard and durable stone used in many Roman buildings, e.g., the columns of the portico of the Pantheon, the emperor Hadrian's villa at Tivoli, the floors and columns of the temple of Venus, in Diocletian's Palace at Split, and in public baths. The cap was found in the large rubbish heap called the South Sebakh south of the Roman fort.

<sup>&</sup>lt;sup>47</sup> Ostraca from Mons Claudianus published by Bingen et. al. (1997) give us names of about 60 soldiers. Two of these apper have have been Gallic, a few Thracians, and nine have Dacian names. None appear to have been Pannonians.

<sup>&</sup>lt;sup>48</sup> The group was looted from Constantinople by the Venetians during the fourth crusade in 1204. The missing heel of one of the tetrarchs was found in 1965 in Istanbul under the Bodrum Mosque, originally the 10th century Myrelaion church, located next to the Philadelphion, the building where the statues were probably originally located. The heel is now housed in the Archaeological Museum in Istanbul.



Fig. 16. Porphyry statues of tetrarchs in pillbox caps. A, B: group at corner of St Mark's basilica, Venice. A: overview. B: detail showing laterally displaced hole in cap at right. Photographs by Nino Barbieri 2007. C: Head of tetrarch, height 17 cm. National Museum of Niš. Adapted from Петровић 2005.

Сл. 16. Порфирне статуе тетрарха са цилиндричним. А, В: група на углу базилике Св. Марка, Венеција. А: преглед. В: детаљ који приказује бочне отворе капе на десној страни. Фото: Нино Барбијери 2007. С: Глава тетрарха, висина 17 цм. Народни музеј у Нишу. По: Петровић 2005.

"He [Diocletian] put ornaments of precious stones on his dress and shoes, when the imperial distinction had previously been only in the purple robe, the rest of the habit being the same as that of other men."  $^{50}$ 

At first, Eutropius' statement seems to be corroborated by the porphyry statues in Venice. However, if the holes were made to hold a central jewel they should have been positioned on the frontal midline. In fact, on the cap of the tetrach on the group's corner the hole is displaced towards his right side (Fig. 16B), and there is also a similar hole at the back. We therefore reject the idea that the holes held precious stones. It has also been suggested that the holes were attachments for wreaths <sup>51</sup>. Although there are no known depictions of

- <sup>50</sup> Translation 1886 by Watson.
- <sup>51</sup> D'Amato suggested (2005, p. 14, note 62) that "this latter is more a diadem-crown,

such caps with wreaths the idea cannot be discarded. However, since the cap on the virtually identical sculture from Niš lacks a hole (see below and Fig. 16C), it appears more probable that the holes were made at a later date for unknown reasons <sup>52</sup>.

But are the caps worn by the tetrarchs an elaborate version of Pannonian caps? We present indications here that this is not the case.

It is almost certain that the pillbox cap was adapted as an imperial headgear by Diocletian, a native of Dalmatia, the southern neighbour of Pannonia. It is striking that there are no unambiguous depictions of pillbox caps anywhere before the tetrarchy, but from c. 300 CE they appear so commonly that many historians have assumed that they had become the standard headgear of soldiers first in the Balkans and then spreading throughout the empire. To us, the timing makes it probable that this headgear was introduced by Diocletian not only for the tetrarchs but for certain groups of officials. Perhaps the pileus Pannonicus was the inspiration for the pillbox cap, or perhaps it was a novel design. We wish to stress that the pillbox cap may well have been selected by Diocletian as the standard attire for several different groups, but in all instances that we have found – apart from the tetrarchs themselves – the pillbox caps appear to be worn by only one group: the *apparitores*, the state-paid civil servants (see below under "Paleochristian sarcophagi"). Naturally, we can assume that the caps worn by the tetrarchs were made of a much more expensive material than those of the apparitores.

From this follows a surprising hypothesis first presented here: the porphyry group in Venice hints at a rather revolutionary way of portraying emperors, namely as civil servants, be it at the very highest level. Diocletian had introduced a completely novel idea of what an emperor was. To put it very down to earth: being an emperor was a job; when you were done with it you retired and someone else (your Caesar) took over <sup>53</sup>. The two Augusti and the two Caesars were obliged to confine their authority to both their respective geographical domain but also according to their position in the tetrarchic system. The division of power into two equal parts - the Jovian and Herculian houses - would ensure a balance of power. The emperors should act as integral parts in a system

<sup>53</sup> The tetrarchic system is the very opposite of the idea of divine emperors in spite of the notions of Iovian and Herculian houses.

as indicated by the holes whose was once attached the bronze crown, than a simple cap, but the form is practically the same as the pileus worn by the common soldiers; the original colour of it was red, with golden crown; i.e. the cylindrical red cap was the under support of metal helmet or crown, as was the normal pileus for the soldiers (Vegetius I, 20)." We reject the proposal – based on the author's belief that the *pileus Pannonicus* is equivalent to the pillbox-shaped cap - that the pillbox-shaped cap was used under soldiers' helmets.

<sup>&</sup>lt;sup>52</sup> ID *aitor iriarte* has suggested on www.romanarmytalk.com that: "The slots on the Venice Tetrarchs are mediaeval and intended for the crane that had to lift them from Constantinople to the ship and then to Venice. [...] In origin, each pair was standing on a huge porphyry column, on a console. When Venetians sacked Constantinople, they crudely sawed off the statues in three fragments for ease of transport. The square holes in the pillei are roughly carved and [there is] one additional hole at the back of the second man's pilleus, for the second 'finger' of the crane's pincer. Moreover, [...) notice that the pilleus of the fourth emperor broke during transport, due to the pressure, just at that point!"

designed to promote stability for the good of the Roman empire more than for the glory of the emperor. This did not conflict with Diocletian's idea that he had god-like qualities <sup>54</sup>.

We entertain the possibility that Diocletian consciously and cleverly decided to adopt the pillbox cap for both emperors and civil servants to send the message that the emperors are part of the system, they are acting for the best of the state, that is, being subordinate to the state. Diocletian was a great organizer, and above all promoted stability, e.g. through the introduction of his tetrarchic system, the regulation of prices, and other reforms. He also persecuted the Christians because they threatened the stability of the Roman empire. These ideas indicate that Diocletian considered that the interests of the state were greater than those of its leaders. Perhaps this was why the headgear of a state-paid civil servant was adopted as a tetrarchic symbol: to send this imperial message.

**Tetrarch head from Niš, Serbia.** A fragment of another porphyry statue showing a tetrarch in a pillbox cap has been found in Niš, ancient Naissus, the birth town of Constantine <sup>55</sup>. The fragment consists of a damaged head slightly smaller than life-size (Fig. 16C), that is, similar in size to the Venice tetrarchs. In this statue, there is no central hole in the cap.

A second example from Serbia possibly showing a pillbox cap-wearing tetrarch is a relief from Felix Romuliana from 298-305 CE showing a rider, possibly Galerius <sup>56</sup>.

**Palaeochristian sarcophagi.** The largest group of early 4<sup>th</sup> C depictions of pillbox caps are found in friezes on the earliest paleochristian sarcophagi. Most or all of these sarcophagi can be dated to the second or third decade of the 4<sup>th</sup> C. Only one can be dated more precisely, to after 328 CE <sup>57</sup>. These sarcophagi are thought to have been produced in workshops in Rome, and transported to the wealthy families who had commissioned them. Findplaces of paleochristian sarcophagi discussed here include Rome and Arles <sup>58</sup>. Other such sarcophagi have been found in Bordeaux, Astorga, and Zaragoza (Spain).

The friezes on these paleochristian sarcophagi share a very distinctive style with the frieze on Constantine's arch (see **Arch of Constantine, Rome** below). It is probable that the latter frieze and many of the sarcophagi were

<sup>&</sup>lt;sup>54</sup> In spite of Diocletian's very pragmatic approach, he and the other tetrarchic emperors saw themselves as divine. "He was the first that introduced into the Roman empire a ceremony suited rather to royal usages than to Roman liberty, giving orders that he should be adored, whereas all emperors before him were only saluted." (Eutropius Book 9: 26). "Diocletian equalled himself to his favoured god, Jupiter, and considered himself as his replacer on earth. He and the other Tetrarchs were considered living gods and were seldom in public." (Sonnemans 2013, p. 10).

<sup>&</sup>lt;sup>55</sup> Found in the Fortress in Niš in 1954. See colour illustrations in Петровић 2005, p. 153, and Rakocija 2013, pp. 90-91, figs. 89, 91.

 $<sup>^{56}</sup>$  https://commons.wikimedia.org/wiki/File:Artifacts\_at\_Felix\_Romuliana,\_fragment\_of\_a\_decorated\_frieze.\_Serbia.jpg

<sup>&</sup>lt;sup>57</sup> The inscription on the sarcophagus of Marcia Romania Celsa (Arles, Musée d'art chrétienne) shows that it was produced no earlier than 328.

<sup>58</sup> Francoise Besson: Sarcophage "de la Trinité". http/www.panoramadelart.com/



Fig. 17. Details of palaeochristian sarcophagi showing officials in pillbox caps. A, B: Dogmaticus sarcophagus. Vatican Inv. 31427. A, Peter's arrest. Detail 2009, after cleaning. B. Detail 2008, before cleaning, showing chisel marks on sides and top of cap made to indicate fur. Details of photographs by M. Pardy. C, D: Sarcophage de "la Trinité" ou "des époux". C: Left scene: miracle of Peter striking the rock, opening a spring to baptize his guards; right scene: Peter seated on his chair is discovered by Roman officials. Arles, Musée de l'Arles antique. N° d'inventaire : PAP.74.00.5. Photographs by LR.

Сл. 17. Детаљ палеохришћанског саркофага који приказује цилиндричне капе. А, В: тзв. Dogmaticus саркофаг. Vatican Inv. 31427. А, Петрово одрицање, детаљ новчића из 2009, после чишћења. В. Детаљ из 2008, пре чишћења.Детаљи фотографије М. Pardy. С, D: Саркофаг Тројства С: сцена лево: чудо Светог Петра, појављивање извора за крштавање војника; десно: Св. Патар седи на столици а испред њега су римски

достојници. Арл, Антички музеј у Арлу, инв.бр.: РАР.74.00.5. Фото: LR.

produced in the same workshop <sup>59</sup>. In all likelihood, the tolerance granted by the Edict of Milan to Christians and other religious groups made possible the first overtly Christian themes depicted not only on sarcophagi but in any media. It

<sup>&</sup>lt;sup>59</sup> Dinkler in Weitzmann, 1977, p. 399.

appears that once it was safe to depict Christian themes, i.e. after 313, wealthy Christians commissioned marble sarcophagi showing a range of scenes taken from the life of Jesus and the apostles.

There are at least 25 known paleochristian sarcophagi showing Roman officials in pillbox caps <sup>60</sup>. As on Constantine's arch (see below), all of these officials wear a mantle and trousers. None carry any arms. The men are clean shaven or occasionally depicted with a cropped beard. The only other persons in the reliefs shown wearing trousers are the three magi (all in Persian dress) <sup>61</sup>. This feature is consistent in all sarcophagi reliefs.

The pillbox cap-wearing men figure in four scenes:

1) The arrest of Peter (Fig. 17A, B).

2) The miracle of Peter drawing water from the wall of his cell to baptize his guards <sup>62</sup> (Fig. 17C, D).

3) Peter seated on his chair is discovered by Roman officials (Fig. 17C).

4) Christ before Kaiphas, being brought before him by Roman guards 63.

In all of these scenes, the Roman officials wearing this particular outfit – pillbox caps, mantle and trousers, but no weapons – and who spot, arrest, and guard the apostle Peter, as well as guard Jesus, are clearly not soldiers. Their identity is revealed in the mid-late 4<sup>th</sup> century <sup>64</sup> apocryphal book Acts of pseudo-Linus <sup>65</sup>, based on the 2<sup>nd</sup> century Acts of Peter, describing the martyrdom of Peter in Rome:

[8] While he was comforting the brethren's minds with these and many other words, Hieros arrived with four *apparitores* <sup>66</sup> and ten other men, who seized him and took him away from the midst of the brethren and brought him bound before the eyes of Agrippa, the prefect of the city. [10] Finally, together with the Apostle and the *apparitores*, a vast number of people arrived at the place which is called Naumachiae, near the obe-

[12] Moreover, he said to the master-executioners: "Why are you dallying? Why, *apparitores*, are you allowing delays to be contrived for me?

The *apparitores* were state-paid officials. There were were four types, arranged in a hierarchy with the *scribae* being highest, followed by the *lictores*,

lisk of Nero on the hill. For there a cross had been put into place.

<sup>&</sup>lt;sup>60</sup> These will be the subject of a separate paper, LR in prep.

<sup>&</sup>lt;sup>61</sup> Romans long regarded trousers, *braccae*, as effeminate, but they were nevertheless introduced by auxiliary troops and widely used in the Late Roman army.

<sup>&</sup>lt;sup>62</sup> From the apocryphal Acts of Peter.

<sup>63</sup> Deichmann 1967, Nr 13; Ubl 1976, 2.2.4., Abb. 4/3.

<sup>&</sup>lt;sup>64</sup> Thomas 2003, p. 43.

 $<sup>^{65}</sup>$  Translation by Andrew Eastbourne 2012. http://www.tertullian.org/fathers/linus\_01\_peter.htm

 $<sup>^{66}</sup>$  Identified as lictors by Thomas 2003: "the Linus text mentions four lictors (apparitores)".

the *viatores*, and the *praecones*.<sup>67</sup> The lictors (*lictores*) were bodygards and assistants to magistrates, i.e., people with *imperium* (that is, imperators, including for example consuls, censors, aediles, and praetors). Their symbol was the fasces, a bundle of wooden rods <sup>68</sup>. In republican Rome, an emperor was accompanied by 24 lictors, a consul by 12, and so on. Among other duties, a lictor could, at his master's command, arrest and punish people including Roman citizens <sup>69</sup>. Centurions from the legions were automatically eligible to become lictors on retirement from the army <sup>70</sup>.

It is clear that in the friezes of the paleochristian sarcophagi, the officials wearing the pillbox cap are not soldiers but officials with the duty to arrest and guard people, in these scenes Peter and Jesus. Their special outfit is clearly associated with the persecution of Christians <sup>71</sup>. Contemporary viewers would have associated these officials, whether lictors or not, with Diocletian's and Galerius' persecution of Christians during their own lifetime (303-312 CE) although the events figured on the sarcophagi took place some 300 years earlier. Regardless of the perspective, for early 4<sup>th</sup> century Christians, the pillbox cap was an anti-Christian signal.

The pillbox caps depicted on the sarcophagi are chiseled to give the appearance of fur (Fig. 17B). Felt produces a smooth surface (as in the cap from Mons Claudianus, Fig. 15C). On the Cap coin, great care has been taken in producing a fur-like surface structure on the cap. Specifically, the curls and dots seen in the Cap coin closely mimics that of so-called Persian lamb (or Karakul), that is, the pelt from fetal and newborn lambs <sup>72</sup>. In Diocletian's Edict of prices <sup>73</sup> there is a felt cap mentioned <sup>74</sup>, costing 200 denarii (at the time, this was the

<sup>71</sup> Brenk 1980, p. 40: "Particularly noteworthy is the scene in which Peter is taken captive. Like Moses, Peter carries a staff. Two soldiers wearing mantles (*chlamys*), trousers (*bracae*), and caps (*pileus pannonicus*) grasp the apostle's arms. In the *profectio* relief on the Arch of Constantine (the departure from Milan), many soldiers in the train are clad in fur caps and mantles like those in the sarcophagus. They are the *apparitores* or *officiales* who played an important role in the presecution of the Christians, for which reason this kind of Constantinian soldier also appears on the Dogmatic sarcophagus. In other words, Peter's being captive was comprehended as a scene from the history of the persecution of the Christians. The conception of the image can only have arisen in a workshop that was in operation both for the emperor and for the Christians."

<sup>72</sup> Today, this type of pelt is still used in many varieties of pillbox caps in Pakistan, Afghanistan, Azerbaijan and large parts of central Asia.

73 https://en.wikipedia.org/wiki/Edict\_on\_Maximum\_Prices

<sup>74</sup> Diocletian's price edict from 301 CE, section 8.16. "A felt cap may cost 200 denarii". Greek text:

8, 15 δερμα πρωτειον ποιον εις πειλιο - Χρ

8, 16 peilion gegen menon – X  $\sigma$ 

Latin text:

8, 15 pellis bellearis prima [denarii] cen[tum]

<sup>&</sup>lt;sup>67</sup> For details see Hardy 2005, pp 24-25.

<sup>&</sup>lt;sup>68</sup> All depictions of fascies appear to be much earlier than the 4th C, and perhaps the vine staff replaced the fascies in Late Roman times.

<sup>&</sup>lt;sup>69</sup> To announce this capacity, an axe blade was usually protruding from the fascies.

<sup>&</sup>lt;sup>70</sup> Dando-Collins 2010, p. 41.



Fig. 18. Mosaics from Villa Casale del Romana, Piazza Armerina, Sicily. Details from the Great Hunt mosaic. A: Senior official wearing pillbox cap and holding a *vitis*. B: Two junior officials. Photographs by LR.

Сл. 18. Мозаици из Вила Касале дел Романа, Пјаца Армерина, Сицилија.Из сцене великог лова А: Старији званичник сацилиндричном капом и витисом В: Два млађа достојника. Фото: LR.

equivalent of 2 silver argentei). However, since the caps on the Cap coin and the palaeochristian sarcophagi clearly are made of fur, they are not the ones mentioned in the price edict.

**Mosaic in Villa Romana, Sicily.** A well-known floor mosaic showing men wearing pillbox caps is preserved in Villa Romana del Casale near Piazza Armerina, Sicily. The mosaic is usually dated to 300-320 CE. Among the many servants and hunters figured are three men wearing pillbox caps (Fig. 18). One of these is clearly senior, and was long thought to be the emperor Maximianus, but now this person is usually regarded as an unidentified high ranking official <sup>75</sup>. He carries a *vitis*, a vine staff with mushroom-shaped end, the mark and tool of a centurion (Fig. 18A). Two younger men <sup>76</sup> in similar outfit carry staffs with slightly more slender ends, T-shaped in profile (Fig. 18B; this may be insignificant, merely showing a range of variation or inaccuracy in the depiction). The mosaic shows a variety of officials and servants or slaves, among them a bareheaded centurion carrying his vine staff, whipping a slave in front of an oxcart. However, the three officials wearing pillbox caps are not themselves involved in catching or transporting animals, but appear to be in charge of the operations.

The officials seen in the Villa Romana mosaic can hardly be interpreted as anything other than *apparitores* of the same type as those appearing in the

<sup>8, 16</sup> *pileum factum* [denarii] ducen[tis]

<sup>&</sup>lt;sup>75</sup> Cammarata 2015, p. 56.

<sup>&</sup>lt;sup>76</sup> Ciurca p. 51.



Fig. 19. Arch of Constantine, Profectio scene (departure from Milan 312 CE). Note that all men wear pillbox caps and trousers but no weapons. To right: detail showing senior, bearded official and younger man, note similarities to the palaeochristian sarcophagi scenes. Images adapted from photograph by R. Seindal 2002.

Сл. 19. Константинов славолук, Profectio scene. Треба приметити да сви мушкарци носе цилиндричне капе и панталоне, али не оружје. Десно: детаљ који приказује старијег, брадатог достојника и младића. Требало би приметити сличности са представама на палеохришћанским саркофазима. Фотографије припадају Р. Сејндалу 2002.

scenes on the paleochristian sarcophagi, that is, they appear to be lictors. The senior man in the mosaic may be the *primus lictor*. We find no evidence to support the idea that he is an emperor <sup>77</sup>. The emperor would hardly carry a centurion's vine staff. If nothing else, it would be unimaginable for Romans to walk on the image of the emperor.

Arch of Constantine, Rome. A famous depiction showing men in pillbox caps is seen on the Arch of Constantine in Rome. The arch was constructed between 312 and 315 CE. The beginning of the frieze shows the *profectio*, the ceremonial departure of Constantine's army from Milan in 312 (Fig. 19). The departure scene shows the baggage train with about ten men, all wearing pillbox caps, mantles and trousers. A few carry staffs (the preservation does not permit their identification as vine staffs) but no weapons are seen.

These men have always been termed soldiers, wearing the *pileus Pannonicus*. However, by analogy with the identically dressed men in the palaeochristian sarcophagi, the Villa Romana mosaics, and the stele from Aquileia (see below), we suggest that they are lictors or the equivalent of lictors. In his capacity of emperor, Constantine would always have been accompanied by lictors. When the army departed from Milan, it appears that a group of lictors or other *apparitores*, or soldiers dressed like lictors, were responsible for the baggage train. Lictors were exempted from military service, and never carried military arms, which may indicate why they were the ones functioning as quartermasters <sup>78</sup>, assigned the task of the baggage train.

<sup>&</sup>lt;sup>77</sup> We also reject the views of L'Orange & Kähler (1969) and others that the mosaic in the trapezoidal vestibule figures Eutropia, Maxentius and Fausta, and that the man performing the sarcifice to Diana in the small hunt mosaic is Constantius flanked by Constantine and Maxentius.

<sup>&</sup>lt;sup>78</sup> Holloway 2004, p. 36: "The quartermasters following in the line of march wear the pillbox hats that were the hallmark of the tetrarchs and their retinue."



Fig. 20. Grave stelae showing men in pillbox caps. A: Stele for the centurion Flavius Augustalis. Early 4<sup>th</sup> century. Width 50 cm. Aquileia, Museo Archeologico Nazionale, Inv. No. 914. Image adapted from lupa 14846 (www.ubi-erat-lupa.org). B: Upper part of grave stele from Trier. Early 4<sup>th</sup> century. Width 42 cm. Unknown photographer.

Сл. 20. Гробна стела која приказује човека са цилиндричном капом. А: Стела за центуриона Флавија Августалија. Рани 4.в. Ширина 50 ст. Аквилеја, Museo Archeologico Nazionale, инв.бр. 914. Слика 14846 са (www.ubi-erat-lupa.org). В: Горњи део гробне стеле из Тријера. Рани 4<sup>th</sup> век. Ширина 42 ст. Непознати фотограф.

It is therefore all the more remarkable that Constantine on the one hand reportedly has a Christian vision <sup>79</sup> that helps him to defeat Maxentius in 313 and take Rome, and furthermore soon thereafter joins Licinius in granting religious freedom to the Christians <sup>80</sup>, and on the other hand shows an apparently anti-Christian theme on the arch celebrating this very victory. Of course the arch was built by the city of Rome to honour Constantine, but had Constantine not approved of the frieze, we can be sure that it would not have remained on the arch. In all likelihood, the arch was inaugurated in Constantine's presence during his visit to Rome in 315 when he celebrated the start of his tenth anniversary year of his accession on 25 July.

We think that the explanation of the frieze is simple: the *apparitores* shown in the departure from Milan on the frieze were, at the time of construction, not seen by non-Christian Romans as anything else than officials performing their normal duties. In the frieze, they assist in transporting goods for Constantine and/or the army. Only Christians would associate their outfit with the lictors responsible over a decade earlier for arresting Christians and guarding them in prison and during trial. Constantine himself - no matter the degree of Christianity he had (or had not) adopted at the time - would in 313-315 hardly have been aware of the symbolism that ordinary Christians would put into the

<sup>&</sup>lt;sup>79</sup> Lactantius, De Mortibus Persecutorum 44.5.

<sup>&</sup>lt;sup>80</sup> In the so-called Edict of Milan; in Lactantius, De Mortibus Persecutorum 48.

lictors' outfit. So to Constatine, and perhaps also to the officials in Rome who had the Arch built in his honour, there were probably no religious connotations in figuring a group of *apparitores* in the departure from Milan.

**Grave stelae.** A few grave stelae from the early 4<sup>th</sup> C show men in pillbox caps. The most important is from Aquileia, erected for the centurion Flavius Augustalis <sup>81</sup>. He is shown wearing a pillbox cap, a mantle over the *tunica manicata*, and long trousers (Fig. 20A). He is leaning on a vine staff with mushroomshaped upper end, marking his rank as centurion. The pillbox cap and trousers indicate that Augustalis is shown in the attire of a lictor. As mentioned earlier, centurions from the legions were automatically eligible to become lictors on retirement from the army. On Augustalis side is a soldier in a short tunic and a shield on his back. It has been suggested that this soldier is also Augustalis <sup>82</sup>. That would mean that Augustalis had retired as a soldier and became a lictor, and was figured in both capacities.

Another grave stele comes from Trier <sup>83</sup>. Only the upper part is preserved, showing a man in pillbox cap with his wife (Fig. 20B). Her hairstyle indicates the early 4<sup>th</sup> C.

**Later depictions.** After this profusion of pillbox caps from c. 300-330 CE, there is a number of similar depictions from the late 4<sup>th</sup> C and early 5<sup>th</sup> C. A fresco in the Church of Sts. Paul and John in Rome, from c. 395 CE, shows a soldier in red cloak and others in white tunics and cloaks, wearing red-purple pillbox caps <sup>84</sup>. The soldiers may represent *Palatini* garrisoned in Rome.

The tradition of figuring lictors in pillbox caps in Christian themes continued. They are figured in an ivory diptych showing the resurrection of Lazarus from c. 400 CE <sup>85</sup>; and in various Christian themes in an ivory panel from a box from c. 420-430 CE <sup>86</sup>. A century later, a similar cap was still a common attirement, possibly in the military, and it continued to be used at least until the 6<sup>th</sup> century <sup>87</sup>.

The Cap coin. We can now reconsider the identity of the headgear worn by Constantine on the Cap coin. Since the outfit of the pillbox cap-wearing men is identical in both the Villa Romana mosaic, the *profectio* scene on the Arch of Constantine, on the paleochristian sarcophagi, and the stele of Augustalis, we take this to indicate that all of these instances figure the same type of official. We interpret this official as a member of the *apparitores*, an interpretation strengthened by the descriptions by pseudo-Linus (above). We conclude that the cap figured on the Cap coin is a pillbox cap of the type worn by the lictors and perhaps other *apparitores*, not a Pannonian cap *sensu* Vegetius.

<sup>&</sup>lt;sup>81</sup> Museo Archeologico Nazionale, Aquileia. Ubl 1976, Abb. 2.1.2. CIL V 914.

<sup>&</sup>lt;sup>82</sup> Michael King Macdona (ID Renatus) on Romanarmytalk: "I saw this figure as a soldier, possibly representing Augustalis himself as a young man". http://www.ro-manarmytalk.com/rat/thread-21066.html

<sup>&</sup>lt;sup>83</sup> Trierer Zeitschrift 5, 1930, 166, pl. 5/1. Ubl 1976, Abb. 2.1.3.

<sup>&</sup>lt;sup>84</sup> D'Amato 2005, p. 34: (1). We have been unable to see this fresco.

<sup>&</sup>lt;sup>85</sup> Milan, Castello Sforza. Ubl 1976, Abb. 3.1.1.

<sup>&</sup>lt;sup>86</sup> British Museum. Ubl 1976, Abb. 3.1.3.

<sup>&</sup>lt;sup>87</sup> D'Amato & Sumner 2005, p. 23.

#### Constantine and Siscia

The two ancient coins described here were almost certainly struck at the Roman imperial mint at Siscia <sup>88</sup>, present day city of Sisak in Croatia. The city was situated on the main road running NW-SE across the Balkan peninsula, connecting to the Via Militaris running further southeast.

In Diocletian's re-organization of 295 CE, Siscia became the capital of the southwestern partition, Pannonia Savia <sup>89</sup>. The city had an imperial mint since 262 CE. Constantine gained control of Pannonia in the civil war against Licinius in 316-317. Siscia was captured in September-October 316.

We can infer from the coinage that Constantine visited Siscia in 317 <sup>90</sup>, although his presence in the city is not recorded in the Codex Theodosianus. In fact, he must have passed Siscia every time he traveled across the Balkans. In June 317, Constantine was in Thessalonika <sup>91</sup>. He then moved to Aquileia, passing Siscia on the way, staying in Aquileia during 318. The following year he moved to Sirmium, again passing Siscia, and in 320 he travelled further SE to Serdica. These major moves alone mean that Constantine passed Siscia at least twice during the the period under consideration here, 318-319, when the Cap coins must have been produced. It is tempting to suggest that the cap coins could have been produced in connection with a stay by Constantine. However, we think that such a suggestion is impossible to underpin at the present stage of knowledge.

## Why the pillbox cap on the coins?

We have presented extensive evidence that the two coins showing Constantine wearing the pillbox cap are ancient. They almost certainly date from 318-319 CE. This date is right in the middle of the 300-330 CE era of depictions showing the pillbox cap. The findspots of the paleochristian sarcophagi show that the concept of the pillbox cap-wearing *apparitores* – identified by us as the lictors - as Christian persecutors was widespread in the western part of the empire, at least among Christians. We know nothing about the situation in the Balkans or further east.

Siscia was close to Italy and people there may well have had the same concept as further west. Still, because Siscia was located in Pannonia, it is possible that the Pannonian cap and/or the pillbox cap had different connotations there than elsewhere. That leaves us with two main hypotheses of why Constantine is depicted wearing a pillbox cap.

<sup>&</sup>lt;sup>88</sup> The mint of Siscia began operating in 262 CE and was closed in 383 CE.

<sup>&</sup>lt;sup>89</sup> Wikipedia: The Pannonia Savia, also known as Savia and Pannonia Ripariensis, was an ancient Roman province. It was formed in the year 295, during the reign of emperor Diocletian. The capital of the province was Siscia (today Sisak). Pannonia Savia included parts of present-day Croatia, Slovenia, and Bosnia and Herzegovina.

 $<sup>^{90}\,</sup>$  RIC VII Siscia 27, dated to 317 CE, is a gold donative celebrating the arrival of Constantine with the legend FELIX ADVENTVS AVG N.

 $<sup>^{91}\,</sup>$  C. Th. viii. 7. 1. The stays in Aquileia in 318 and Sirmium in 319 are well attested in C. Th.

A local message. The imperial mint or an engraver at the mint decided to depict the emperor wearing a well-known local headgear. Perhaps it was not important – or even known - that this headgear had become a symbol of first the tetrarchic emperors and then of the persecution of Christians. The PERT abbreviation was easily understood locally. We find this hypothesis difficult to defend and are inclined to reject it.

A general message. We think that the pillbox cap is only the first part of a tri-partite message. The cap is no longer an imperial symbol but that of a lictor.

The second part of this message is that Constantine wears a paludamentum only, without a cuirass. That is, he wears a garment of a civilian, a stateemployed official, an *apparitor*, not of an emperor or a soldier prepared for war, in contrast with all other VLPP coins from Siscia, exclusively showing Constantine in his military capacity.

The third part of the message is the PERT in the obverse legend. This unique abbreviation should hold the final clue to the capacity in which Constantine is depicted. The position between CONSTANTINVS and AVG indicates either a name - an alternative we reject - or a title. Unfortunately, we are unable to suggest a convincing or even likely reading of PERT. However, to stimulate further analyses we here present a speculative reading. The closest appropriate Latin word we can find is the one for lawyer, *peritum*, from Latin *peritus*, skilled, knowledgeable, expert. In the style of Roman abbreviation in inscriptions, words with the stem *perit*- could be abbreviated PERT. However, only the discovery of new epigraphic material can provide clues to the reading of PERT.

We have suggested that Diocletian may have introduced the pillbox cap of the *lictores* as an imperial regalia as a sign that the imperial office from now on was subject to the Roman state. Diocletian's ideas failed. By 318 CE, when the Cap coins were struck, Constantine had long ago abandoned the last remnants of the tetrarchic system. The pillbox cap was long abandoned as an imperial symbol but was recognized as the hallmark of the *apparitores*. The cap had become a symbol of Christian persecution, at least among Christians. And then it astonishingly appears on a coin, and on the head of the now all-powerful emperor. An emperor who had ground down the tetrarchic system until nothing remained, and who had granted religious freedom to groups that many feared or hated, or just thought of as un-Roman.

We can only assume that the Cap coins were meant to enter circulation. Their message must have been intelligible to those using these coins. Illiterates would understand the imagery, and literates would in addition understand the written message. Considering the discussion above, the coins are showing Constantine wearing the pillbox cap of both the tetrarchs and the *apparitores*. The message possibly becomes a bit clearer: could it be a reference to the imperial office being subject to the Roman empire? It does not appear likely that this is a view that Constantine himself would have favoured, but apart from previously persecuted groups like the Christians, many Romans must have appreciated Diocletian's revolutionary and (for an emperor) humble view: the emperor holds an office, he must not become a tyrant, and his power must be bal-



Fig. 21. Genuine and fake Cap coins figured at same magnification. A, C: Example struck from modern dies, sold 2014 as reproduction on eBay by seller from Bulgaria. Diameter 25.0mm, weight 5.33g. B: 2003 Cap coin. Photographs by LR.

Сл. 21. Оригинални и лажни новчићи са капом А, С: Примерак продат 2014, у складу са репродукцијом eBay трговца из Бугарске. Пречник 25.0mm, тежина 5.33g. В: 2003 новчић са капом. Фото: LR.

anced by others. Maybe the pillbox cap coins were made as a subtle reminder: Constantine had sadly become the all powerful dictator that Diocletian had done everything to try to prevent from taking power.

This explanation may seem fanciful, and we are certainly not saying that ours is the final word on this matter. Most important, a convincing reading of the PERT in the obverse legend could either strengthen or completely overthrow our explanation.

## Copies

The Cap coin instantly became famous. Not surprisingly, this attracted the attention of forgerers. Newly produced copies of the coin soon appeared on the commercial market (Fig. 21). Most or all of these are produced from a single pair of dies <sup>92</sup>. These copies are considerably larger than the original coin, and indeed considerably larger than any Siscia VLPP coin. Some have been listed as genuine <sup>93</sup>, and others as reproductions <sup>94</sup>.

<sup>&</sup>lt;sup>92</sup> We have seen eight such examples in auctions and on Internet sites.

<sup>93</sup> Pegasi Numismatics, Auction XXII (April 2010), lot 599.

 $<sup>^{94}\,</sup>$  H D Rauch, Summer Auction 2010 (September 2010), lot 1717, described as "moderne Phantasiemünze".

## REFERENCES

Alföldi 1921	Andreas Alföldi, Il Tesoro di Nagytétény. Rivista Italiana di Numismatica 34, Seconda Serie 4, 113-190.	
Bingen et. al. 1997	Jean Bingen, Adam Bülow-Jacobsen, W.E.H. Cockle, Hélène Cuvigny, François Kayser, Wilfried Van Rengen <i>MONS CLAUDIANUS, OSTRACA GRAECA ET LATINA II</i> (O. Claud. 191-414) (DFIFAO XXXII), Cairo.	
Brenk 1980	Beat Brenk, The Imperial Heritage of Early Christian Art. In Kurt Weitzmann (ed.), Age of Spitrituality. A Symposium. Metropolitan Museum of Art, New York, 1980, 39-52.	
Bruun 1966	Patrick Bruun, Constantine and Licinius A.D. 313-337. The Roman Imperial Coinage, Vol. VII (Eds. C.H.V. Sutherland, R.A.G. Carson). Spink and Son Ltd, London. 778 pp, 24 pls.	
Bülow-Jacobsen 1996	Adam Bülow-Jacobsen, Archaeology and Philology on Mons Claudianus 1987-1993. Topoi 6, issue 2, pp. 721-730.	
Cammarata 2015	Enzo Cammarata, The Roman Villa of Casale. Historical Facts and Curiosities. English Edition. 123 pp.	
Ciurca undated	Salvatore Ciurca, Mosaics of the Villa "Erculia" in Piazza Armerina. Nicolo Maltese, Palermo. 118 pp. (c. 2001).	
Cope et al. 1997	L. H. Cope, C. E. King, J. P. Northover, and T. Clay, Metal Analyses of Roman Coins Minted Under the Empire. British Museum Occasional Paper Number 120, British Museum Press, London.	
Croom 2010	Alexandra Croom, Roman Clothing and Fashion. Amberley Publishing, 2010. 192pp.	
D'Amato 2005	Raffaele D'Amato., A Protospatharios, Magistros, and Strategos Autokrator of 11 <sup>th</sup> cent. ΠΟΡΦΥΡΑ, Dicembre 2005, Supplemento n. 4. 75 pp.	
D'Amato & Sumner 2005	Raffaele D'Amato and Graham Sumner, Roman Military Clothing (3). AD 400 – 640. Osprey Publishing Ltd., Oxford, UK, Men-at-Arms 425. 48 pp.	
D'Amato & Sumner 2009	Raffaele D'Amato and Graham Sumner, Arms and Armour of the Imperial Roman Soldier. From Marius to Commodus, 112BC - AD192. Frontline Books, Barnsley, UK. 290 pp.	
Dando-Collins 2010	Stephen Dando-Collins, The Legions of Rome. Quercus Publishing Plc, UK. 604 pp.	
Deichmann 1967	Friedrich Wilhelm Deichmann, Repertorium der christ- lich-antiken Sarkophage. 1. Rom und Ostia. Textband und Tafelband. F. Steiner, Wiesbaden.	
Dinkler 1979	E. Dinkler in Kurt Weitzmann (ed.), Age of Spirituality. Late Antique and Early Christian Art, Third to Seventh Century. Metropolitan Museum of Art, New York, 1979.	

Eutropius	Eutropius, Abridgment of Roman History. In: Justin, Cornelius Nepos, and Eutropius. Literally translated by the Rev. John Selby Watson. George Bell and Sons, London (1886), pp. 401-505.
Hardy 2005	Ernest George Hardy (ed.), Roman Laws and Charters. The Lawbook Exchange, Ltd, Clark, New Jersey.
Holloway 2004	R. Ross Holloway 2004, Constantine and Rome. Yale Univ. Press, New Haven and London. 191 pp.
Jørgensen 2004	Lise Bender Jørgensen, A Matter of Material: Changes in Textiles from Roman Sites in Egypt's Eastern Desert. An Tard 11, 87-99.
Lactantius	Lucius Caecilius Firmianus Lactantius, De Mortibus Persecutorum. http://www.tertullian.org/fathers2/ANF-07/anf07-15.htm#P3916_1567226.
Mannering 2006	U. Mannering, Questions and Answers on Textiles and their Find Spots. The Mons Claudianus Textile Project. In: S. Schenk (ed.), <i>Textiles In Situ. Their findspots in Egypt and Neighbouring Countries in the first millennium CE.</i> Riggisberger Berichte 13, pp. 149-159. Riggisberg.
L'Orange & Kähler 1969	Hans Peter l'Orange & H. Kähler, 1969. La villa di Massenzio a Piazza Armerina, <i>Acta</i> ad Archaeologiam et Artium Historiam Pertinenta (AAAHP) 4, pp. 41-50.
Петровић Ж. 2005.	Народни музеј у Нишу 1933-2003. Ниш 2005. 350 pp.
Propokov & Manov 2005.	Ilya Propokov and Rumen Manov, Counterfeit Studios and their Coins. SP-P Publishing Ltd, Sofia. 88pp.
Pseudo-Linus	Pseudo-Linus, Martyrdom of the Blessed Apostle Peter (Martyrium beati Petri apostoli a Lino conscriptum). Translated by Andrew Eastbourne. http://www.tertullian. org/fathers/linus_01_peter.htm.
Rakocija 2013	Miša Rakocija. The Constantine's City – Ancient Christian Niš. (in Serbian and English). 367 pp.
Ramskold 2009	Lars Ramskold, Highly Deceptive Forgeries of Constantine's SPES PVBLIC Coinage. The Celator, Dec 2009, pp. 18-32.
RIC VII	See Bruun 1966.
Sonnemans 2013	Iskander Sonnemans, Imperial Portraiture of the Tetrarchs: a Material Approach. Bachelor Thesis, Classical and Mediterranean Archaeology, Univ. of Leiden. https:// www.academia.edu/4821608/Imperial_Portraiture_of_the_ Tetrarchs_A_Material_Approach
Sumner 1997	Graham Sumner, Roman Army: wars of the empire. Brassey's (UK) Limited. 144 pp.
Sumner 2003	Graham Sumner, Roman Military Clothing (2): AD 200-400. Osprey Publishing Ltd., Oxford, UK, Men-at-Arms 390. 48 pp.

Thomas 2003	Christine M. Thomas, The Acts of Peter, Gospel Literature, and the Ancient Novel: Rewriting the Past. Oxford University Press. 190 pp.
Ubl 1976	Hannsjörg Ubl, <i>Pilleus pannonicus</i> , die Feldmütze des spätrömischen Heeres. In: H. Mitscha-Märheim, H. Friesinger und H. Kerchler (eds): Festschrift für R. Pittioni zum 70. Geburtstag, vol. II, pp. 214-241. Archaeologia Austriaca Beiheft 13. Vienna.
Vegetius	Publius Flavius Vegatius Renatus, Epitome of Military Science. Translated with notes and introduction by N. P. Milner. Liverpool University Press, 1993.

#### Ларс Рамсколд, Роналд Бјуд, Захари Бисли МЕТОДИ АУТЕНТИФИКАЦИЈЕ АНТИЧКОГ БРОНЗАНОГ НОВЦА: СТУДИЈА СЛУЧАЈА КОНСТАНТИНОВЕ "ПАНОНСКЕ КАПЕ" НА НОВЧИЋУ

У науци разматрани и најконтроверзнији од свих античких бронзаних новчића је такозвани новчић "Панонска капа" пронађен 2003. године. Новчић приказује Константина I са капом налик цилиндру. На новчићу су предузета детаљна стереоскопска, иконографска, радиолошка испитивања (XEDS и микро CT скенирање). Сваки сегмент испитивања показао је да је реч о античком новчићу и да се са сигурношћу може рећи да је откован у интервалу од 318-319. Године. Поседује извесне сличности са другим новчићем са капом, пронађен 2012. године и за који се испоставило да је такође антички. Идентификовали смо да оба новчића имају готово идентичан реверс тако да се са сигурношћу може рећи да је реч о царској ковници Сисциа. У тексту приказујемо различите украсе за главу почетком 4. века, од порфирних тетраха у Венецији и Нишу, Константиновог лука, мозаика у римској вили на Пјаца Армерина; на бројним палеохришћанским саркофазима конвенционално названом Вегетијева "Панонска капа", види се уствари капа ликтора која се носила у то време. Стога идентификујемо ову капу на новчићимакао ликторову капу.