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## FORGING SAMIAN WARE IN THE PANNONIAN WAY: THE CASE OF STAMPED POTTERY

The term *pannonische Glanztonware* is commonly used to describe either a variety of pottery with stamped decoration or 'plain' ware with grey slip. These vessels were produced at an unknown number of sites in *Pannonia* but can be divided into three main types: Eastern, Western and South Pannonian. This study focuses on some groups found at *Aquincum* (one of the East Pannonian workshops) because more than 3000 stamped sherds have been identified here and tens of thousands of pieces of 'plain grey ware' as well. Based on this ceramic assemblage, some general conclusions can be drawn from the method, forms, decorative schemes and the motifs used in their manufacture.

#### The Celtic tradition issues

The origin of this pottery is very complex, the finds illustrate how native traditions and imported wares merged stylistically and technically, demonstrate how local manufacture was influenced by the Roman Conquest, the tastes of the various settlers who moved into the territory, and the new needs of soldiers and citizens, leading to a whole new pottery type.

One of the main questions is based on an assumption implicit in previous research<sup>4</sup> stating that "the aspect of the origin of a form may also be considered, as the forms of indigenous and Roman pottery making traditions may correspond with each other, especially in the case of hemispherical bowls", and patterns "on vessels following indigenous traditions may appear on its interior"<sup>5</sup>.

The hemispherical bowl concerned (**fig. 1,7.15; 2,16**) is the form L. Nagy 8,11–16<sup>6</sup>, Adler-Wölfl and Pavić Sü 2.1<sup>7</sup>

<sup>1</sup> Maróti 1987, 81–82,

and these bowls are variants of Consp. 36, Ritterling 8 and Drag. 40. Éva Maróti shares the view that temporal variations can be seen among the earliest forms and patterns:8 "Die frühesten Werkstätten fungierten wahrscheinlich schon am Ende des 1. Jahrhunderts u. Z. Sie könnten flache, auf der Innenseite mit 2 bis 4 Blattstempeln verzierte Schüsseln hergestellt haben (Póczy 1952, 103). Die Blütezeit der Gruppe kann an das Ende des 1. Jahrhunderts bzw. an den Anfang des 2. Jahrhunderts, also in die traianisch-hadrianische Zeit datiert werden (L. Nagy 1942, 257). Die früheren Exemplare sind grau und innen verziert, während die späteren, außen verzierte Stücke, Varianten der Form Drag 37 sind. Die spätesten Stücke sind rot." These create inconsistencies because she also claims that the so-called 'Resatus type' pottery was produced in the Trajan-Hadrian period and was already characterized by 'Roman' formal and decorative schemes.9

However, the earliest East Pannonian workshops would have produced vessels stamped with two to four leaf motifs arranged radially in the interior. The same motif may often be seen on the exterior of the vessels as well (**fig. 1**). The beginning of the production (end of the 1<sup>st</sup> century AD) may coincide with the activity of Resatus, <sup>10</sup> Deuso<sup>11</sup> and other potters who stamped *planta pedis* and other patterns inspired by Samian wares, inside and even outside of the vessels. Among eastern Pannonian types an earlier group where stamping occurs on the interior of the vessel is not apparent. Furthermore, there is a Drag. 37 bowl on which the Resatus name stamp is visible accompanied by other motifs characteristic of his workshop (**fig. 1,14; 7.6**). The fabric and the slip of the vessels tend to be mostly irrelevant for distiguishing groups in the find material of *Aquincum*.

The same is the case with the origin of the motifs. The theory is that: "... the earlier motifs found at the settlement are higher among the indigenous motifs that were not modeled on Samian wares. These are the trees (Figs. 1.1, 7.4), 'fruits' (Figs. 1.1, 8.2), the 'hour-glass' motif (Figs. 1.1, 2.3), the majority of the rosettes (Fig. 9.11), as well as the five and seven-lobed leaves (Figs. 9.5–6), the horseman (Fig. 1.2) and the majority of animal figures (Fig. 9.13)."

<sup>&</sup>lt;sup>2</sup> I would like to thank P. Zsidi, A. Facsády, M. Pető, J. Beszédes, K. Szirmai, M. Németh, O. Láng, T. Budai Balogh, T. Hable, Z. Havas, P. Hárshegyi, A. Kirchhof, G. Lassányi, O. Madarassy and P. Vámos to for allowing me to study and publish the material, and for the help of A. Choyke, K. Csontos, G. Fényes, B. Rikker, K. Sréter, G. Varga, N. Varga and L. Vass.

The limited extent of this study does not allow a detailed catalogue so only a selection of the sherds can be published here.

É. F. Petres, A mányi eraviscus temető/Das eraviskische Gräberfeld von Mány. Folia Arch. 17, 1965, 96–97; Póczy 1952, 103; Marótti 1987, 81.

<sup>&</sup>lt;sup>5</sup> Miklósity 2012, 238–239.

Published: Maróti 1991, 415 Fig. 1.

Rundwandschüssel mit gerundeter Wandung und geradem Rand: ADLER-Wölfl 2004, 40–43; I. PAVIĆ, Zum Formenspektrum der pannonischen Glanztonkeramik von Wien 1, Michaelerplatz – Grabungen 1990/91. Fundort Wien 7 (Wien 2004) 125; 127.

<sup>8</sup> Maróti 1987, 93.

<sup>9</sup> Ibid. 81.

<sup>&</sup>lt;sup>10</sup> Nagy 1931, 54–56.

NAGY/BESZÉDES 2009, 392–393; 399.

MIKLÓSITY 2012, 240–241. The same conclusion: Ibid. 239.

Even though the stamped decoration is based on Hellenistic and Celtic traditions, the ornaments are rather imitations of those found on Samian Ware. <sup>13</sup> The motifs mentioned above are not found on Celtic vessels. The types being produced are relatively variable and show how the potters adapted the style of imported wares. They include: vessels with *planta pedis* stamp (**fig. 2**), radial leaf decorations or name stamps in the interior of the bowls (**fig. 1**), local interpretations of South Gaulish motifs (ovolos, scrolls, festoons, chevrons, geometric patterns, animals and some human figures in a same zonal design or in free-style). In some cases, the style of South Pannonian stamped pottery is actually recognizable (**fig. 3,1–5**). <sup>14</sup>

Occasionally, precise adaptation of Samian ware motifs (**fig. 4**) can be observed together with 'local' patterns in a transferred design: for example the kneeling archer (Oswald 268, Déchelette 35) with hunting scenes, <sup>15</sup> man with torch (Oswald 977–978, Hermet 98, 249), lion (Oswald 1419, Déchelette 118), Diana (Déchelette 17), <sup>16</sup> hare (Déchelette 950a), S-shape gadroon or palisade (Hermet Pl. 50/44), festoon wih spiral (Knorr Taf. 36/A). <sup>17</sup>

A Celtic origin is indicated only by the grey slip of the vessels and a very few animal motifs (**fig. 5**). No 'indigenious forms' have so far been identified in the collection of the Aquincum Museum among the *pannonische Glanztonware*. The formal typology and classification of pottery types developed by L. Nagy was published by É. Maróti. The drawings of form 26 and 27, however are misleading, since they are half-sized in the published scale. Form 17 (Drag. 29) is also false, in reality it is a sherd of a Drag. 37 bowl<sup>20</sup> as well as form 19<sup>21</sup>. Drag. 29 mentioned by K. Póczy<sup>22</sup> is rather a larger Drag. 33 type (**fig. 3,11**).

Moreover, the typology of basic forms and the figures shown below are intended to represent a selection of a few special or unique (unusual) forms and decorative schemes (fig. 3,6–14). As seen above, there are no forms of Celtic origin even among the rare types of *pannonische Glanztonware*. Less common forms usually retain the use of the same decorative elements utilizing well-known motifs. In some

cases, an imitation of cut glass technique can be observed on beakers with stamped motifs (**fig. 1,8; 3,9**).<sup>23</sup> Additional stamped patterns may also appear on handles of jugs or on the rim of some vessels.<sup>24</sup> Such decorations can even be observed on snake-vessels<sup>25</sup>, marbled wares<sup>26</sup> or glazed pottery<sup>27</sup>.

É. Maróti and M. Miklósity Szőke suggest that "the dentated engraving – up to our present observations – is characteristic for the products of the workshops from Western Pannonia, Gorsium and Brigetio"<sup>28</sup>, but use of rouletted bands (or rings) and wreaths (bands of leaves) seems mainly random in the *Aquincum* material.<sup>29</sup>

Based on this study, it was found that some of the shapes and *planta pedis* stamps may have been inspired by Italian, Pontic and Eastern Sigillatas (especially the form of **fig. 2,11.14**. and the stamps **fig. 2**) – although these motifs were sometimes placed on the exterior surface of the vessel. In the region of the Kiscelli pottery workshop (in the *Aquincum* Military Town) imitations of Eastern Sigillata B2 of very high quality and their variants of 'Pannonian grey' version suggest that potters skilled in this technique arrived together with the army from Asia Minor or Italy.<sup>30</sup> Two sherds (with the same *planta pedis*; **fig. 2,4**) from vessels that were probably made in the Kiscelli workshop display close similarities to stamped decoration found on Pontic and Eastern Sigillatas.<sup>31</sup>

In conclusion, the shapes and decorations of *pannonische Glanztonware* appear to be strong influenced by Samian wares – based on the taste and technical skill of local and probably immigrant potters. The issues of the 'legionary pottery' therefore arises the same way as in the case of the imitations of Eastern Sigillatas.<sup>32</sup>

### Attempts to attain the effect of low relief

M. Miklósity Szőke suggests that "besides the fact that the stamped decoration can be positive or negative, the possibility of the use of a model vessel should also be considered

<sup>&</sup>lt;sup>13</sup> Nagy L. 1928, 100.; id. 1942, 254.; Póczy 1952, 102–103.

This style can be observed in Dacia too: e. g. V. Rusu-Bolinder, La céramique estampée de Napoca. RCRF Acta 37, 2001, 177–190.

NAGY L. 1928, 96-113.; MARÓTI 2002, 153-171.

K. Szirmai, Kaszárnyák az aquincumi 2-3. századi legiotábor praetenturájában (1987–1988)/Barrack-blocks in the praetentura of the Legionary Fortress in Aquincum (1987–1988). Budapest Régiségei 31, 1997, 279, Fig 13. 1.

J. Déchelette, Les vases céramique ornés de la Gaule romaine I–II (Paris 1904); F. Hermet, La Graufesenque (Condatomago) I–II (Paris 1934); R. KNORR, Töpfer und Fabriken verzierter Terra sigillata des ersten Jahrhunderts (Stuttgart 1919); F. Oswald, Index of Figure Types on Terra sigillata (London 1964).

MARÓTI 1991, 425, Fig. 1 (based on the manuscript of L. Nagy).

NAGY L. manuscript 70.

J. Hampel, A m. n. múzeumi érem – és régiségtár 1881-ben (májusdecember). Arch. Ért. 4, 1882, 63.; ID., A papföldi közfürdő. Budapest Régiségei 2, 1890, 73.; NAGY L. 1928, 96.; É. MARÓTI, Egy pannoniai terra sigillata gyár termékei Balácán/Die Erzeugnisse einer pannonischen Terra Sigillata-Werkstatt in Baláca. Balácai Közl. 7, 2002, 169 Fig. 4 1

D. Gabler, Importált reliefdíszű sigillaták és pannoniai utánzataik/ Moulded imitations of Samian ware in Pannonia. Arch. Ért. 103, 1976, 39-40 Fig. 6.

<sup>&</sup>lt;sup>22</sup> Póczy 1952, 103 T. 23,4.

Thereby associated with the cut glass technique: É. Bónis, Üvegtechnikát utánzó poharak Aquincumban/Tonbecher mit Glasschliffdekor aus Aquincum. Budapest Régiségei 13, 1943, 473–476; 574.

<sup>&</sup>lt;sup>24</sup> Póczy 1952 T. 1–3.

Aquincum: P. Vámos, Schlangengefäße in Aquincum. In: Sz. Bíró (ed.), EX OFFICINA. Studia in honorem Dénes Gabler (Győr 2009) 544–547; 553 Abb. 5. – Tokod: Marótti 1997, 299; 301; 310 V. t. 4.; VII. t. 6.; XI. t. 1; Kat. 15,12.23.66. – Carnuntum: V. Gassner, Schlangengefäße aus Carnuntum. In: H. Vetters/M. Kandler (eds.), Akten des 14. Internationalen Limeskongresses 1986 in Carnuntum. RLÖ 36/2 (Wien 1990) Abb. 5.3.

Aquincum: AM Inv.Nr. 2001.17.16. – Balatonfűzfő: ADLER-WÖLFL 2004, 89 footnote 289. – Poetovio: É. Bónis, A császárkori edényművesség termékei Pannóniában/Die kaiserzeitliche Keramik von Pannonien. Diss. Pannonicae 2,20 (Budapest 1942) 169, T. 21,47; 32,9.

Aquincum: AM Inv.Nr. 2008.4.6428. – Gorsium: L. BARKÓCZI, Frührömische glasierte Keramik in Ungarn. In: Zs. Bánki/V. Cserményi (red.), Glasierte Keramik in Pannonien (Székesfehérvár 1992) 30–35 Abb 55, 57

<sup>&</sup>lt;sup>28</sup> Maróti 1997, 317; 324; Miklósity 2012, 240.

Particulary, in the light of the stamped pottery of Biatorbágy-Kukoricadűlő (Miklósity 2012, 223–251) as every motifs have analogies in the Aquincum Museum.

HAYES 1985 form 75; GABLER ET AL. 2009, 65–69.

<sup>&</sup>lt;sup>31</sup> HAYES 1985, 93 Tav. 22,6–10; D. ZHURAVLEV, Terra sigillata and red slip pottery from the late Skythian necropoleis of the South-western Crimea. RCRF Acta 36, 2000 Fig. 2,6–7; 6,9.

<sup>&</sup>lt;sup>32</sup> Gabler et al. 2009, 67-69.

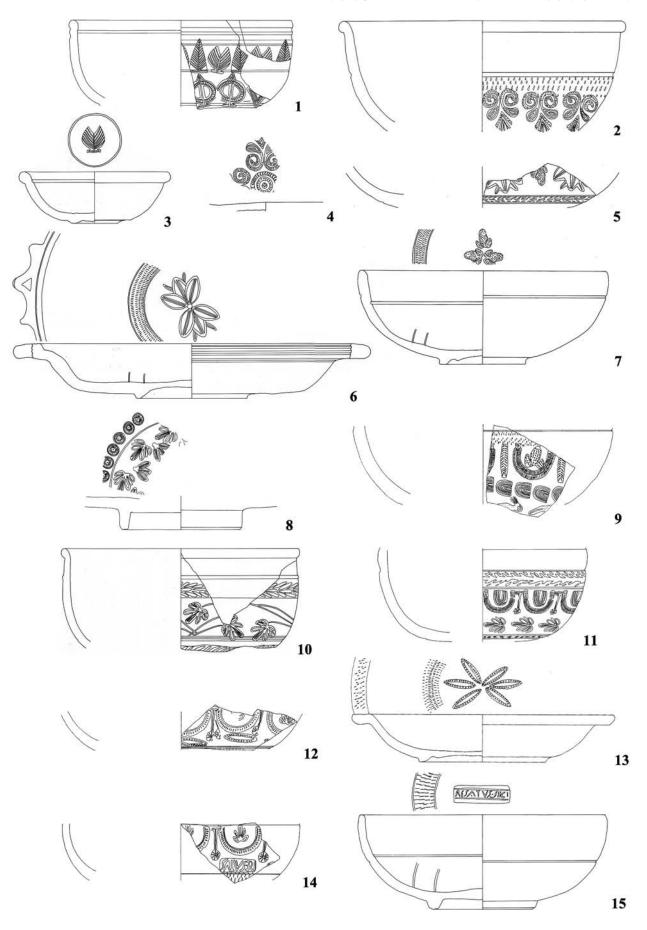
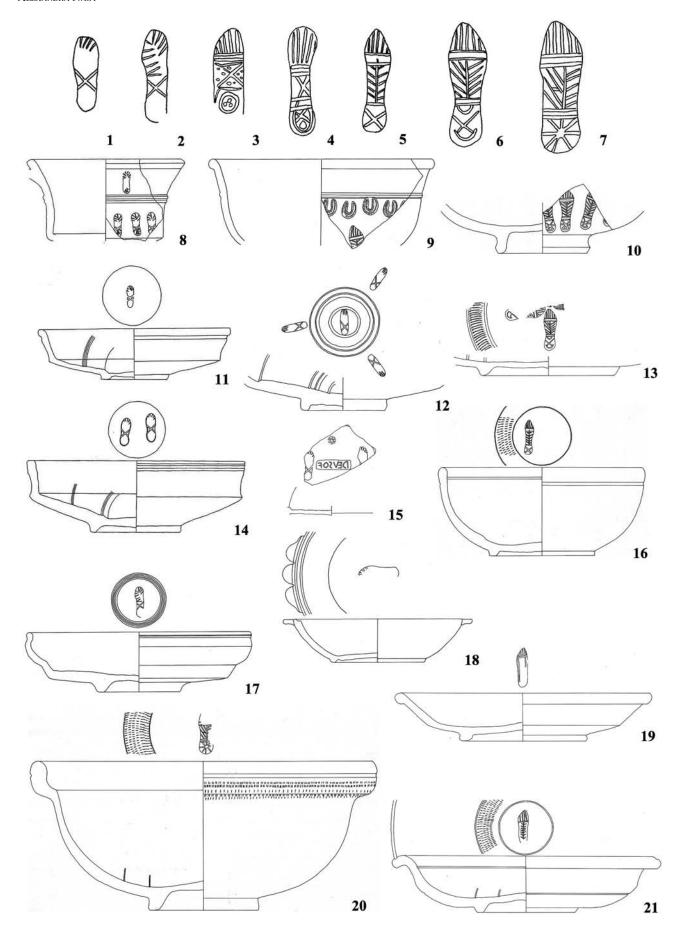


Fig. 1. Identical motifs shown on the interior and on the outside of the vessels. – Scale 1:3.



**Fig. 2.** Vessels with *planta pedis* stamp. -1-7 scale 1:1; 8–21 scale 1:3.

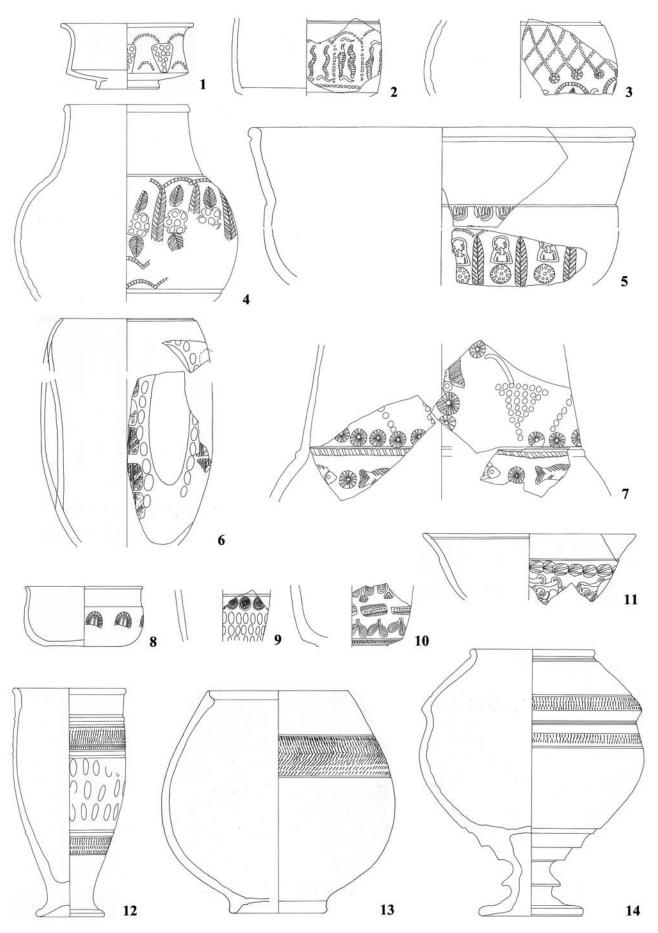


Fig. 3., 1–5 Vessels in the style of South Pannonian stamped pottery; 6–14 Selection of rare forms. – Scale 1:3.

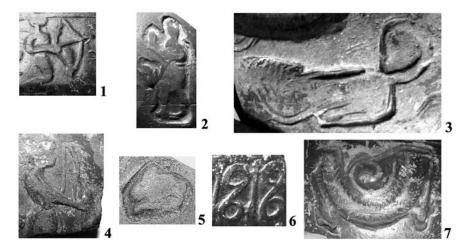


Fig. 4. Precisely adopted Samian ware motifs. – Scale 1:1.



**Fig. 5.** Motifs of probable Celtic origin. – Scale 1:1.

(Redő 2005, 305, Fig. 16b), especially with bands of leaves (Fig. 9.12)."<sup>33</sup>

Usually, individual stamps (or punches, poinçon) were used to produce decorative details but sometimes, mostly in case of wreaths and roulettings, the use of a tool, similar to 'molettes' or 'roulettes', can also be observed instead of a negative mould (vessel). Decorations in low relief are rare. To achieve this effect, potters may have used roulettes to create repetitive designs, such as the egg-frieze or an individual stamp with only one or two different motifs, either carved in positive or recopied from another stamp by moulding. The use of moulds is unlikely because the frame or upper and lower edge of the stamp can always be seen, and the motifs are combined in a commonly used technique. Besides, in some cases, exactly the same motif is recognizable - mirrored horizontally on different bowls (fig. 6). Regarding the dating of this type, one of this group was produced before around AD 100 based on the second construction phase of the Aquincum Civil Town.34 The technique found on a few pieces<sup>35</sup> is difficult to clarify: they were either made with stamps, moulds, en barbotine, application or other way.

# Identifying the group or the names of potters – from Resatus to Victoria

Lajos Nagy was the first to write about stamped pottery and separated different workshops on this basis.<sup>36</sup> Based on his research, out of the 18 various sized pottery workshops known today, five can be considered as locations of stamped pottery production in the area of *Aquincum*: the so-called Kende Street (Lágymányos) workshop, the Kiscelli Street/Bécsi Road workshop as well as the Aranyárok, *Macellum* and Papföld workshops.<sup>37</sup>

There is some evidence that the so-called Lágymányos pottery workshop<sup>38</sup> was one potential centre for mass fabrication: a vessel stamp, a firing waste fragment (broken during the firing process) of a bowl with a *planta pedis* stamp,<sup>39</sup> a rouletted, deformed sherd, and the dominance of stamped pottery and 'plain' grey *Pannonische Glanztonware* characterized by similar artistic standards and decorative schemes.<sup>40</sup> The manufacture of this kind of pottery began in the Flavian period in this workshop and stopped around the second half of the 2<sup>nd</sup> century AD.<sup>41</sup>

The identification of the formal typology and classification of the decorative motifs suggest that stamped pottery has the potential to provide more information on workshops and

<sup>&</sup>lt;sup>33</sup> Miklósity 2012, 239.

LÁNG 2012, 178 AM Inv.Nr. 91.6.3238.

e.g. AM Inv.Nr. 50231; 68.3.351.; 2006.40.1860+1888.

NAGY L. 1942, 627–636.

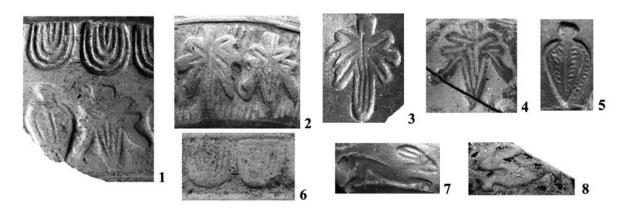
Póczy 1956, 73–136; Póczy/Zsidi 1992, 10 Abb. 3; recent summary: Adler-Wölfl 2004, 113–115. One of the sites is not a pottery workshop: in the Selmeci Street, "the material lacks any indication to a certain pottery workshop" (P. Hárshegyi/ P. Vámos, Új eredmények egy régi anyag kapcsán. Módszertani és csapattörténeti megjegyzések az aquincumi Selmeci utcai fazekasműhely leletanyagának vizsgálata során/New results from old material. Methodological and military historical observations based on the study of the pottery finds of Selmeci utca in Aquincum. Fiatal Római Koros Kutatók Konferenciakötete 1, 2007, 172

PETŐ 1976, 85–96; ID. 1979, 271–285; J. BESZÉDES/L. A. HORVÁTH, Őskori és római kori lelőhelyek a Budai Skála bontása során/Prehistoric and Roman period sites uncovered during the demolition of the Budai Skála department store. Aquincumi Füzetek 14, 2008, 141–157; J. BESZÉDES, Újabb kora császárkori teleprészlet Lágymányoson/Part of a new Imperial period settlement at Lágymányos. Ibid. 16, 2010, 113–118.

<sup>&</sup>lt;sup>39</sup> Nagy/Beszédes 2009, 396; 398–399 Kat. 13 Fig. 7,5.

<sup>40 19.1%</sup> of the find materials of Kende Street.

<sup>&</sup>lt;sup>41</sup> Pető 1976, 94; id. 1979, 281; Póczy/ Zsidi 1992, 10; 37.



**Fig. 6.** Stamped motifs mirrored horizontally. – Scale 1:1.

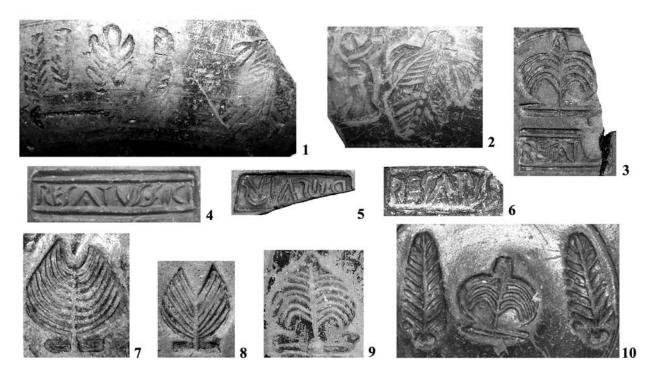


Fig. 7. Resatus type ware: name stamps, Victoria and stylized leaves or trees. – Scale 1:1.

trade networks. The best method for distinguishing groups is to collect the motifs that appear together on these vessels.

A useful starting point may be the Drag. 37 type bowl with Resatus name stamp (**fig. 1,14; 7,6**) mentioned above. The leaf motif appearing on it occurs with another stylized leaf on another bowl (**fig. 7,1**) which can also be observed accompanied by a Victoria stamp (**fig. 7,2**). This Victoria stamp was identified as a possible product of the workshop in Kende Street<sup>42</sup> (Lágymányos area) but other motifs within this group also have many analogies from here.<sup>43</sup> One example of this group<sup>44</sup> from the *Aquincum* Civil Town may be helpful in

Láng, the sherd belongs to the 3<sup>rd</sup> construction phase of the settlement dating from the end of the 1<sup>st</sup> century AD (around AD 100), until the end of Trajan's reign. <sup>45</sup>

Resatus's name stamps (mostly RESATVS-FIICI: **fig.** 

achieving greater chronological precision. According to O.

Resatus's name stamps (mostly RESATVS·FIICI; **fig. 1,15**; **7,4**) and leaves (or trees; **fig. 7,3.7**) always appear on the interior of the vessel as a central mark<sup>46</sup> except for the one piece mentioned above. It is not known if the stamp acted as an 'advertisement' or distinguished the work of different potters. The shorter version (only RESATVS or RIISATVS retrograd; **fig. 7,3.5.6**) can be seen in the interior of smaller vessels. A further complicating factor is that the leaves placed next to name stamps<sup>47</sup> also come in various sized versions (**fig.** 

<sup>&</sup>lt;sup>42</sup> Pető 1976, 91 Fig. 1–2; ib. 1979, 276 Abb. 5,2.4; É. Maróti, Pannoniai pecsételt kerámia/Pannonian Stamped Pottery (PhD thesis, ELTE Inst. Arch. Scien. Budapest 1986) 191–192; Póczy/Zsibi 1992, 12–16.

The topic and group of Resatus type ware will be published in a later paper.

<sup>&</sup>lt;sup>44</sup> AM Inv.Nr. 93.12.2821.

<sup>45</sup> Láng 2012, 111; 113; 176–178.

Maróti 1991, 382; 384–391; 420–424 Fig. 4–8; 9,6–7; 10,1–2.

<sup>&</sup>lt;sup>47</sup> Ibid. 427 Fig. 11,2–4.

**7,7–10**). Localization of his workshop is very hard: currently there are two possible areas: *Aquincum* and *Gorsium*.<sup>48</sup> There is a remarkable similarity between the finds of the two sites: the same patterns can mostly be seen on the vessels. The most striking is the stamp of a festoon, imperfect or damaged on the right side.<sup>49</sup> Hopefully, the material analysis of the finds already in progress will also help to identify or at least separate workshop areas.<sup>50</sup>

# The economy and commerce of *Aquincum* and *Gorsium* in the context of stamped pottery

Examining the find material from the two sites, there are still a wide range of aspects related to this topic that can be explored. The classification of the decorative motifs may be helpful in determining the ceramic groups and estimating the capacity of the workshops, based on how fast decorative styles changed and how many series were produced of each type. The proportion of the specific groups in the indigenous settlements and in towns might also be examined and even the character of the target audience. Are these vessels be quality commodities meant for a more exclusive customer or were they produced for a mass-market? Why were some simple types so popular (festoons with leaves and for example hares) while others motifs (human and other animal figures) are very rare, even though the potters would have been able to stamp special motifs together with the more common ones as well? Was the high proportion of bowls with hares on them connected to fashion or customers liked and choosed from what they simply see? Why would it have been easier to stamp motifs one by one and not using mould vessels? What is the reason for the lack of originality in many cases and lack of care in the decorative production technique (motifs stamped on each other or figural patterns upside down)? The proportion of stamped vessels is very low among grave goods in the same way as Samian Ware but when they occur, they are not the low-quality ones. At the same time, an equally large number of them were discovered in the territory of the Aquincum Civil Town, indigenous settlements, vici, villas and legionary fortresses so this simple ware cannot be indicators of poverty.

The differences between local and import wares are greater than for example the fake of modern big-brand shoes (due to the production technology) but the motifs are not so contrasting. However, local vessels do not follow the themes of Samian Wares, moreover, there is only one thematic scene (hunting). The stamped motifs do not reflect Celtic traditions and, thus, these imitations do not function as a unifying social tool in this case.

Therefore, the question arises whether the commodities market was characterised by customers' demand or local potters discovered a market for cheap imitations of imports? Was stamped technology and the popular grey colour a demand of the local inhabitants or was there an "inventor behind the scenes"? Could this inventor have been Resatus himself? Based on the early date of his pottery could have he been the first to promoted this Romano-Celtic hybrid type with some eastern elements or do we need to look for a larger group? It is also very interesting that there is only one Drag. 37 type bowl with his name stamp while other forms with his name are more common both in *Aquincum* and *Gorsium*. In this case, if Resatus (or his *oeuvre*) worked in both settlements, can there be chronological differences between the two sites or should one of the sites be considered a branch of the other?

Travelling between the two towns would have been relatively fast (approximately 45–50 Roman miles – depending on the location of the workshop and the market), so was it worthwhile to operate two workshops or did he have to move to another place to be closer to the market, or did he have several storerooms in different towns and only one workshop somewhere in the area of *Aquincum*?

The recently completed analyses<sup>51</sup> provides a partial answer to these questions: the potential raw material of all tested vessels with a Resatus stamp (ten pieces from the Aquincum Museum) are shown to be made from the so-called "Kiscell clay", which was generally mined and used in *Aquincum*. However, in order to determine the existence of the workshop here, it will be necessary to evaluate a larger, more statistically valid number of samples.

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<sup>&</sup>lt;sup>48</sup> NAGY L. 1931, 54–56.; ID. 1942, 155–157; 256; J. FITZ, Gorsium – Herculia (Székesfehérvár 1976) 61; MARÓTI 1991, 384.

<sup>&</sup>lt;sup>49</sup> e. g. Aquincum: Nagy L. 1931, 52–56; Gorsium: Zs. Bánki, Forschungen in Gorsium in den Jahren 1983/84. Alba Regia 23, 1987, Taf. 16,407.

The analysis is being carried out by M. Tóth (Geochemical Research Institute, Hungarian Academy of Sciences). The results will be published later.

The unpublished XRD and XRF analysis was carried out by M. Tóth within the framework of the project OTKA "Study of the archaeological material from the Eastern cemetery of the Civil Town of Aquincum" (principal investigator: G. Lassányi)

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