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## VINDOBONA COMMON WARE PRODUCTION: WHAT THE EXCAVATION (RENNWEG 44) OF MATERIAL FROM THE CIVILIAN SETTLEMENT ADDS TO CURRENT RESEARCH<sup>1</sup>

With the contribution of Roman Sauer

*This paper introduces an overview of current knowledge about common ware (oxidised ware) production at Vindobona (Pannonia): kiln distribution within the area and the presence of wasters are indicators of such activity. The new contribution results from the almost concluded project about the excavation at Rennweg 44. Archaeometric analyses made possible the description and interpretation of a wide fabric collection related to all pottery forms, which will serve as reference basis for future material. The analysis of some possible potters' tools, hitherto not found at Vindobona and generally very rare, will allow the easier identification of other workshops. In the local pottery the link with Italy can be found in the preference for imitations of terra sigillata, of metal and glass forms and for the "legionary" style. A large part of the production consists of provincial forms with parallels in Pannonia, sometimes modified in details by local tastes. This resulting pattern placed Vindobona in the production program already established for the castra on the Danubian limes.*

### Pottery production in Vindobona

The quality of the clay deposits where *Vindobona (Pannonia)* is located, the presence of waterways<sup>2</sup> and the fuel provided by the surrounding forests (Wienerwald) have made a continuous pottery production possible<sup>3</sup> from the Celtic period<sup>4</sup> almost uninterruptedly to the present. In the Roman period (end of 1<sup>st</sup> – beginning of 5<sup>th</sup> century AD), tile production and other ceramic building material by the 13<sup>th</sup>, 14<sup>th</sup>, 10<sup>th</sup> legions located here is known, next to the pottery production<sup>5</sup>. The broad export radius of these bricks gives a hint of the value of this clay resource<sup>6</sup>.

Of the pottery production of this period, the best analysed is the common ware, fired in oxidising atmosphere: Other productions probably include common ware fired in reducing atmosphere<sup>7</sup>, late Roman glazed pottery<sup>8</sup>, Pannonische Glanztonware<sup>9</sup>, fine ware<sup>10</sup> and lamps<sup>11</sup>.

The interpretation of this pottery class from an excavation, made in 1989–1990 at Number 44 of the **Rennweg** road (**fig. 1,1**),<sup>12</sup> now allows some data to be added to this briefly examined view. Between 3 and 6 strip buildings and some workshops (for metal, possibly glass and pottery) were found in this excavation, inside the civilian settlement<sup>13</sup>.

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<sup>2</sup> S. GRUPE/CH. JAWECKI, Geomorphodynamik der Wiener Innenstadt. Fundort Wien 7, 2004, 28.

<sup>3</sup> Several streams, now disappeared, especially in the Hernals area where the most important clay deposits existed: M. KRONBERGER/M. MOSSER, Die Straßen von Vindobona. In: I. Gaisbauer/M. Mosser, Straßen und Plätze. Ein archäologisch-historischer Streifzug. Monogr. Stadtarch. Wien 7 (Wien 2013) 111 Abb. 2; R. GIETL/M. KRONBERGER/M. MOSSER, Rekonstruktion des antiken Geländes in der Wiener Innenstadt. Fundort Wien 7, 2004, 40.

<sup>4</sup> R. PITTIONI, Ein spätkeltischer Töpferofenfund von Wien III. Jahrb. Landeskd. Niederösterreich 28, 1939–1943, 4 Abb. 2.

<sup>5</sup> M. MOSSER/CH. GUGL, Archäometrische und archäologische Untersuchungen an gestempelten römischen Ziegeln aus dem Raum Carnuntum und Vindobona. Fundort Wien 6, 2003, 236; MOSSER 2015, 72–73; M. MOSSER, Zwei römische Ziegelöfen in Wien 17, Steingasse 16/ Gebelgasse 47. Fundort Wien 16, 2013, 160 (with bibliography); 161 Abb. 18.

<sup>6</sup> The most distant site reached by these exports is: the military fortress at Göd-Bócsaújtelep (near Szentendre), thanks to M. Mosser; M. MOSSER, The legionary fortress of Vindobona (Vienna, Austria): change in function and design in the Late Roman Period. In: R. Collins/M. Symonds/M. Weber, Roman Military Architecture on the Frontiers (Oxford, Philadelphia 2015) 82.

<sup>7</sup> Studies regarding this pottery class production have not been carried out, however kilns wasters and a lot of misfired pottery have also been found also at Rennweg 44, see MÜLLER ET AL. 2018.

<sup>8</sup> CHINELLI 2010 with bibliography.

<sup>9</sup> Some assumptions have been made by KRONBERGER 2004, 94–101 and R. SAUER, Die mineralogisch-petrografischen Analysen von Keramik aus Wien 1, Spiegelgasse 11–13, Töpferofen 2. Fundort Wien 7, 2004, 112–116.

<sup>10</sup> E. Eleftheriadou and R. Sauer are studying the matter, see for Reitschulgasse 2–4 MÜLLER ET AL. (forthcoming) and B. PETZNEK (forthcoming). – Some hypotheses based on the amount of finds are in: E. ELEFTHERIADOU, Römische Gefäßkeramik mit tropfenförmigem Barbotinedekor aus Vindobona. Fundort Wien 17, 2014, 134; 146; 148; some fabric types are considered local: 153 Kat. Nr. 34 Probe 49. – Cannot be ruled out: I. PAVIĆ, Feinware: Becher und Faltenbecher des 2. und 3. Jahrhunderts von Wien I., Michaelerplatz – Grabungen 1990/1991. Fundort Wien 10, 2007, 182.

<sup>11</sup> Mostly lamp moulds, also found at the brick workshops of Hernalser Hauptstrasse 59–63: see K. ADLER-WÖLFEL in: Mosser 2015, 75. Some fabrics related to the lamps found at Rennweg 44, by microscopic analysis, could correspond to local reference groups see R. CHINELLI in: S. Sakl-Oberthaler in MÜLLER ET AL. (forthcoming).

<sup>12</sup> MÜLLER 2002; M. MÜLLER, Wohnbauten in der Zivilsiedlung von Vindobona – Lebensorte. In: P. Scherrer (ed.), Domus. Das Haus in den Städten der römischen Donauprovinzen. Akten des 3. Internationalen Symposium über römische Städte in Noricum und Pannonien, ÖAI Sonderschr. 44 (Wien 2008) 105–121.

<sup>13</sup> The interpretation of the stratigraphy has been carried out by M. Müller, despite rather incomplete documentation not always supported by stratigraphic methodology.

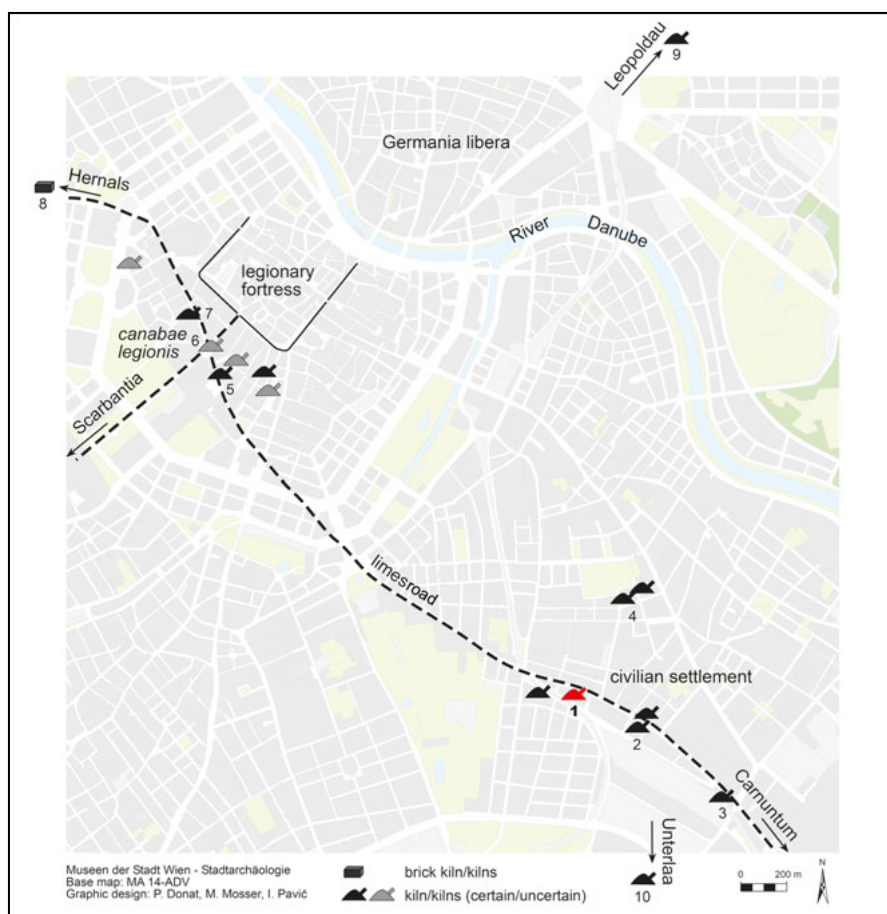


Fig. 1. Locations of find sites with one or more pottery/brick kiln in *Vindobona*.

The problem at the beginning of the study of the common ware production in *Vindobona* was the difficulty in attributing precise artefacts to the kilns discovered at the beginning of the 20<sup>th</sup> century (fig. 1).

The documentation is incomplete and the finds are, sometimes, missing<sup>14</sup>, in part because of an selection based on now obsolete criteria at the time they were found<sup>15</sup> or following the destruction of the museum during World War II<sup>16</sup>.

Kilns excavated at the beginning of this century on the limes road, such as those at **Herrengasse 9** (2<sup>nd</sup>/3<sup>rd</sup> century AD) (fig. 1,7)<sup>17</sup> or at **Reitschulgasse 2–4** (fig. 1,5, beginning of 2<sup>nd</sup> century AD)<sup>18</sup> have not been published yet<sup>19</sup>, while others,

such as those at **Michaelerplatz** (fig. 1,6), are just conjectured, because of minimal evidence or a lack of documentation.<sup>20</sup> However, it was possible to relate some products to known kilns, e.g., the kiln at **Boerhaavgasse 29** (fig. 1,4) in the civilian settlement<sup>21</sup> in which wasters of underfired Pannonische Glanztonware or similar pottery products (fig. 2,2–3)<sup>22</sup> and also common ware have been found and archaeometrically analysed<sup>23</sup>.

been found too: M. KRENN/P. MITCHELL/J. WAGNER, 1.-Reitschulgasse 2, Stallburg. Fundber. Österreich 44, 2005, 69–70 Abb. 92.

<sup>20</sup> See some of the published distribution maps to date: O. HARL, *Vindobona. Das römische Wien*. Wiener Geschichtsbücher 21/22 (Wien, Hamburg 1979) 200–201 Plan 3; D. GABLER, *Die Keramik von Vindobona*. In: *Vindobona – die Römer im Wiener Raum*. 52. Sonderausstellung des Historischen Museums der Stadt Wien (Wien 1978) 125–126; CHINELLI 1998, 155; P. DONAT in: R. Chinelli/P. Donat/I. Pavić, *Importazioni dall'Italia ed elementi di tradizione italiana nella ceramica romana rinvenuta a Vienna (Austria), con particolare riferimento agli scavi urbani effettuati nel Michaelerplatz (1990/1991)*. Acta RCRF 38, 2003, 194 fig. 3; M. KRONBERGER (Hrsg.), *Vindobona. Das römische Wien* (Wien 2009) 67.

<sup>21</sup> CHINELLI 1998, 155 with bibliography. The kiln has never been published and the recent material replacing of the Wien Museum could offer a new catalogue of such wasters.

<sup>22</sup> Photo taken at Olympus SZ-PT 11 binocular microscope (at 18× magnification). Bottom footing width: 1 cm.

<sup>23</sup> R. Sauer found that 10 bottoms showed a biscuit fired in oxidising atmosphere and an outer layer fired in reducing atmosphere. He thinks that a sudden lack of oxygen in the kiln could have caused such phenomenon. These fragments would have been fired at low temperature, according to the physical sensation given by the crumbly clay. Some items have intermediate features between “Pannonische

<sup>14</sup> The *Vindobona* kilns distribution map is continuously updated according to new finds from excavation and to new museum entries, see CHINELLI 2010, 49. Too fragmentary structures are not indicated.

<sup>15</sup> R. CHINELLI, Late Roman glazed pottery production in Eastern Alpine area and Danubian province: the case of *Vindobona*. In: Ch. Magrini/F. Sbarra, *Late Roman glazed pottery production in Eastern Alpine area and Danubian provinces*. First results of the project. First International Meeting of Archaeology in Carlino; 14–15 Dec 2007 (Carlino 2009) 41; presumed for the Late Roman glazed pottery by: M. KRONBERGER, *Siedlungsschronologische Forschungen zu den canabae legionis von Vindobona*. Monogr. Stadtarch. Wien 1 (Wien 2005) 164.

<sup>16</sup> CHINELLI 1997, 121.

<sup>17</sup> M. KALTENEGER, *Wien 1, Herrengasse 9*. Fundber. Österreichs 42, 2003, 71.

<sup>18</sup> I thank B. Petznek. These kilns have probably produced pots, because a large amount of them has been found here and archaeometrically could be local.

<sup>19</sup> Close to a metal workshop, where strip buildings/“Streifenhäuser” have

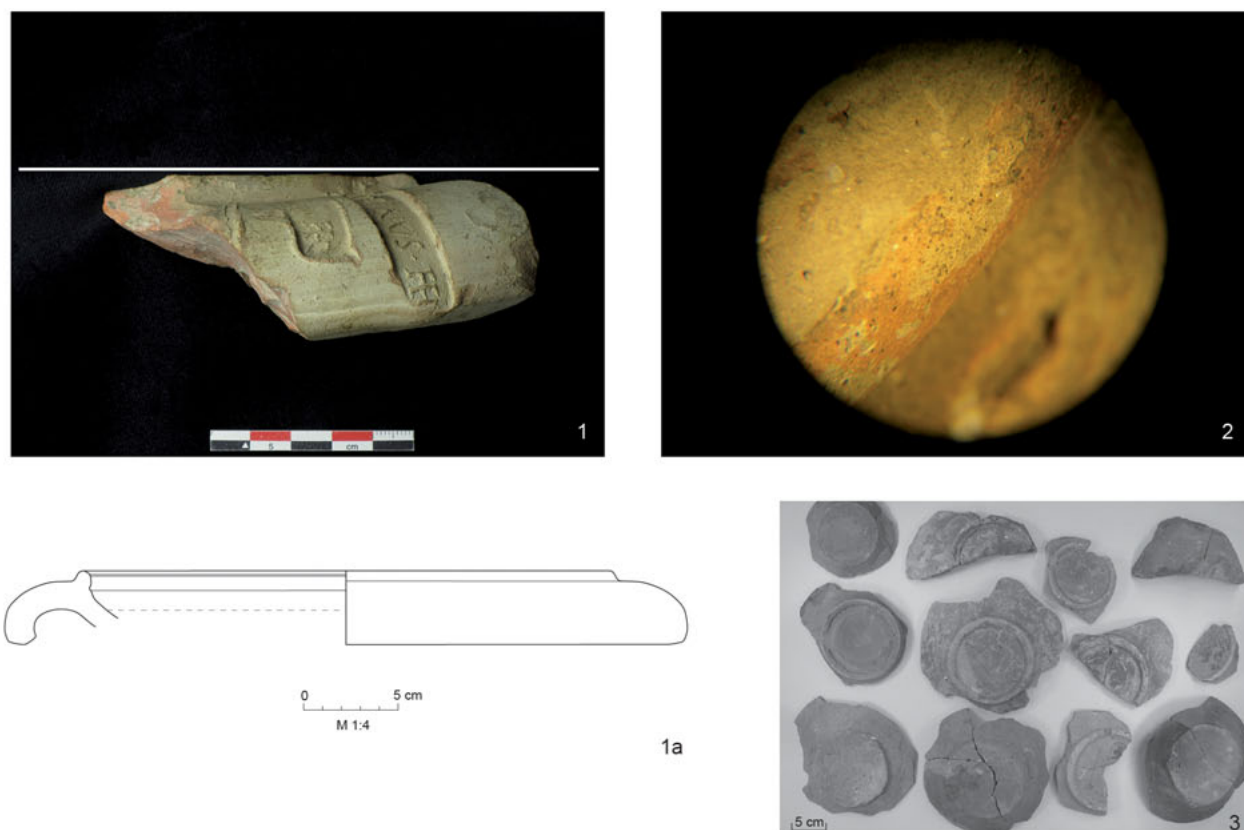


Fig. 2. Wasters from *Vindobona* kilns.

Different wasters, at the same time overfired, warped and bloated, have been found at **Michaelerplatz** (fig. 1.6) – where there was only a trace of a possible kiln. They refer to flanged bowls, “vasetti ovoidi”, folded beakers and jugs with funnel-shaped rim, that were spread all over the excavation area.<sup>24</sup> A pit – interpreted as a potter’s dumping deposit – was filled with wasters of flanged bowls, a bowl with horizontal rim and jugs with a funnel-shaped rim, among the most common in *Vindobona*.<sup>25</sup>

In the *territorium*, a small kiln for the production of common ware has been recognized at **Unterlaa** (fig. 1.10). The pottery was macroscopically compared with the clay of the firing chamber<sup>26</sup> and dated to the 3<sup>rd</sup> century. The potters used a clay deposit at Unterlaa.

Elsewhere, remaining in the *territorium* to the north of Vienna, beyond the Danube, a careful re-analysis of many finds (fig. 1.9) has contributed to strengthening the assumption of a local production of late Roman glazed pottery and common ware at the **Leopoldau** kiln<sup>27</sup>.

In 2011 some rectangular ditches and circular pits were found behind a kiln discovered in 1907, at **Rennweg 96** (fig. 1.3) on the limes road. They have been interpreted as clay deposits or as kiln dumps or as clay working pits<sup>28</sup>. This latter pit type contained a warped and bloated kiln waster of a beaker in fine ware<sup>29</sup>. North of this in a circular pit there was a flanged bowl with red slip, very common in *Vindobona* (similar to fig. 9.1) and a bottom unusually decorated with concentric grooves. The entirely conserved flanged bowl<sup>30</sup> shows defects: water dissolves the slip and makes the ceramic body soft and flexible. Some analysis and the conservation treatment will perhaps be able to determine if this kind of deterioration is due to the action of the soil in which it was previously contained or only to a firing failure<sup>31</sup>. From the

Glanztware” and common ware and therefore are difficult to identify, see e. g.: V. GASSNER, Pannonische Glanztonware mit Stempelverzierung aus Carnuntum. Ptujski arheološki zbornik ob 100-letnici muzeja in Muzejskega društva (Ptuj 1993) 363 Gruppe 5.

<sup>24</sup> R. CHINELLI in: Donat 2003, 87–88; 76 Abb. 6; 80 Abb. 8; 89 Abb. 10.

<sup>25</sup> R. CHINELLI in: Donat 2003, 73 Abb. 5; 76. For the interpretation see Donat 2003, 85–87. Furthermore, 76 pots “mit eingeschnürter Wand”, belonging to non-Roman tradition and fired in reducing atmosphere, have been archeometrically analysed and interpreted as local: DONAT 2003, 81–85 and R. SAUER in: Donat 2003, 91.

<sup>26</sup> K. ADLER-WÖFL, Die römische Siedlung von Unterlaa (Grabungen 1974–1999) (Doctorate thesis, Vienna 2003) 45–46; 79: she attributes 138 fragments to 3 kilns, grouped according to the macroscopic view into two fabric types. The best wasters are pots, Taf. 19, dated to the end of the 3<sup>rd</sup> cent. AD and unfinished lids found on the perforated oven floor: Abb. 38; K. ADLER-WÖFL, Ausgrabung Unterlaa – Ein Siedlungskomplex im Hinterland des Limes. Fundort Wien 1, 1998, 114–115.

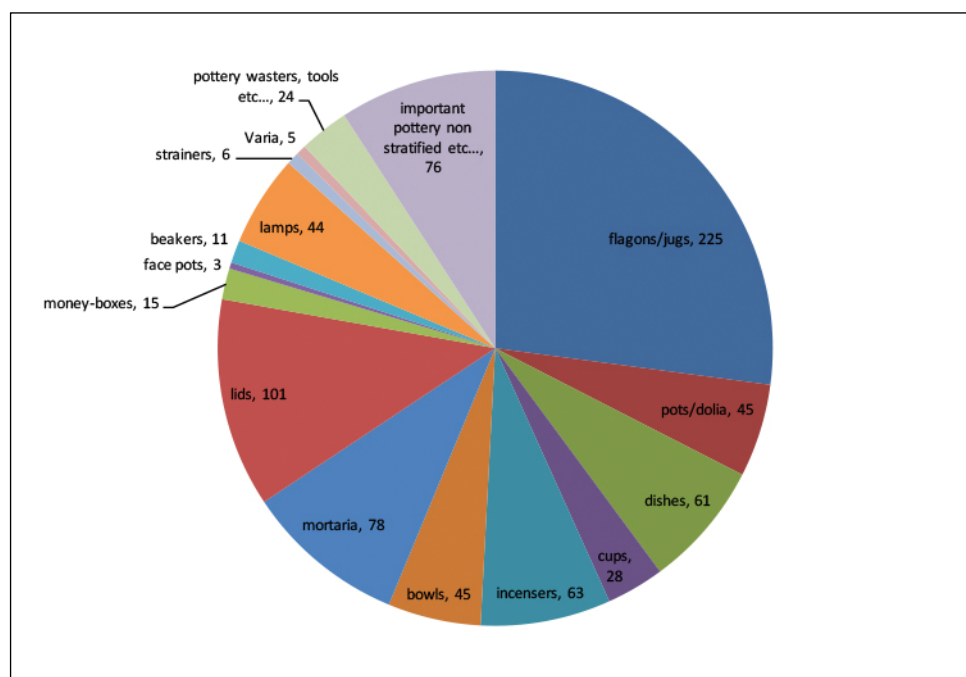
<sup>27</sup> CHINELLI 2010.

<sup>28</sup> M. MOSSER/S. JÄGER-WERSONIG/K. ADLER-WÖFL, Zur Peripherie der römischen Zivilsiedlung. Vorbericht zu den Grabungen Wien 3, Aspanggründe (Rennweg 94–102/Ziakplatz/Aspangstraße 59–65). Fundort Wien 14, 2011, 209–208 Abb. 8; 203 Abb. 1 and Abb. 10; CHMELAR/MOSSER/JÄGER-WERSONIG 2011, 453.

<sup>29</sup> E. g.: Inv. Nr. 80371, beaker with a cornice rim (2<sup>nd</sup>/3<sup>rd</sup> cent. AD). Thanks to E. Eleftheriadou.

<sup>30</sup> Inv. Nr. 80370.

<sup>31</sup> Thanks to R. Sauer and A. M. Cosentini: some analyses with hydrochloric acid solution between 5 % and 15 % on a terrain sample have been just taken, the last layer in which the fragment was found doesn’t seem acid. Since macroscopic observation didn’t show any salt crystallization



**Fig. 3.** Analysed common ware from Rennweg 44: around 830 items.

typological point of view, the presence of this flanged bowl with red slip as a kiln waster would not be a surprise. The type was already archaeometrically analysed in the past and today a local production can be assumed, since its fabric could be local, as with the example from Rennweg 96<sup>32</sup>. Several misfired pottery pieces have been excavated there, among the filling material of some superficial layers<sup>33</sup>.

Furthermore, a kiln waster of a *mortarium* with the stamps *Latinus fec(it)* and *fec(it)*, has been found in the recent excavation in Hernalser Hauptstraße 59–63, 150 m northwest of the brick kiln of **Steinergasse 16/Gablergasse 47** (fig. 2,1/1a).<sup>34</sup> Its fabric corresponds to local reference groups. The flanged bowl type is also attested at Rennweg 88–90, in filling layers from demolitions of the 2<sup>nd</sup>/3<sup>rd</sup> century AD. *Latinus* is already known in *Vindobona* from a similar stamp (now lost) also mentioning the 14<sup>th</sup> legion.<sup>35</sup> The first two items have a fabric similar to the bricks from the kiln at Steinergasse 13–15<sup>36</sup>.

The typological *spectrum* of the local Common Ware of the Middle Roman Period is only partially recognizable from the wasters because the shapes are deformed. In the middle of the 1990's, in order to extend this knowledge, it was decided to carry out some archaeometric analyses with the cooperation of Roman Sauer, a geologist from the Universität für angewandte Kunst of Vienna, who held a wide range of reference samples. The performed archaeometric

analyses are thin-sections and heavy minerals analyses. The composition of the pottery samples is compared with raw materials of known clay deposits.<sup>37</sup>

### Common ware (fired in oxidising atmosphere) at Rennweg 44: supposed production

The common ware, fired in oxidising atmosphere, found at **Rennweg 44** (fig. 1,1) dates to the same time frame as the same ware from the civilian settlement<sup>38</sup>.

It begins in the second half of the 1<sup>st</sup> century AD, continues on the 2<sup>nd</sup> century AD, with a strong concentration in the first half and a shrinkage in the second half of the 3<sup>rd</sup> century, to which few glazed flanged bowls belong, which perhaps continue into the 4<sup>th</sup> century AD. On the other hand, in the military fortress it is also dated to 280/320–350/360 AD, even though it is scarcer there and interpreted as residual material of former period<sup>39</sup>.

Before the examination at Rennweg 44, archaeometric analyses of the pottery of the Middle Roman Period had been made for flanged bowls<sup>40</sup>, “vasetti ovoidi e piriformi”<sup>41</sup>, and

and the fracture zone has a quite compact appearance, it does not seem that the deterioration is due to the particular conditions (saline or acid) of the terrain.

<sup>32</sup> CHINELLI 1998, 155. Fabric type: GK-ST 1.

<sup>33</sup> *Non vidi*. CHMELAR/MOSSER/JÄGER-WERSONIG 2011, 454.

<sup>34</sup> K. ADLER-WÖLFEL in: MOSSER 2015, 74, Anm. 53.

<sup>35</sup> MOSSER/CHINELLI ET AL. 2016, 125.

<sup>36</sup> CHINELLI 1998, 156; CHINELLI 1997, 121.

<sup>37</sup> G. OLCESE, Ceramiche comuni ed archeometria. In: G. Olcese, *Ceramica romana ed archeometria: lo stato degli studi*. Atti delle giornate di studio (Castello di Montegufoni 1993) 92.

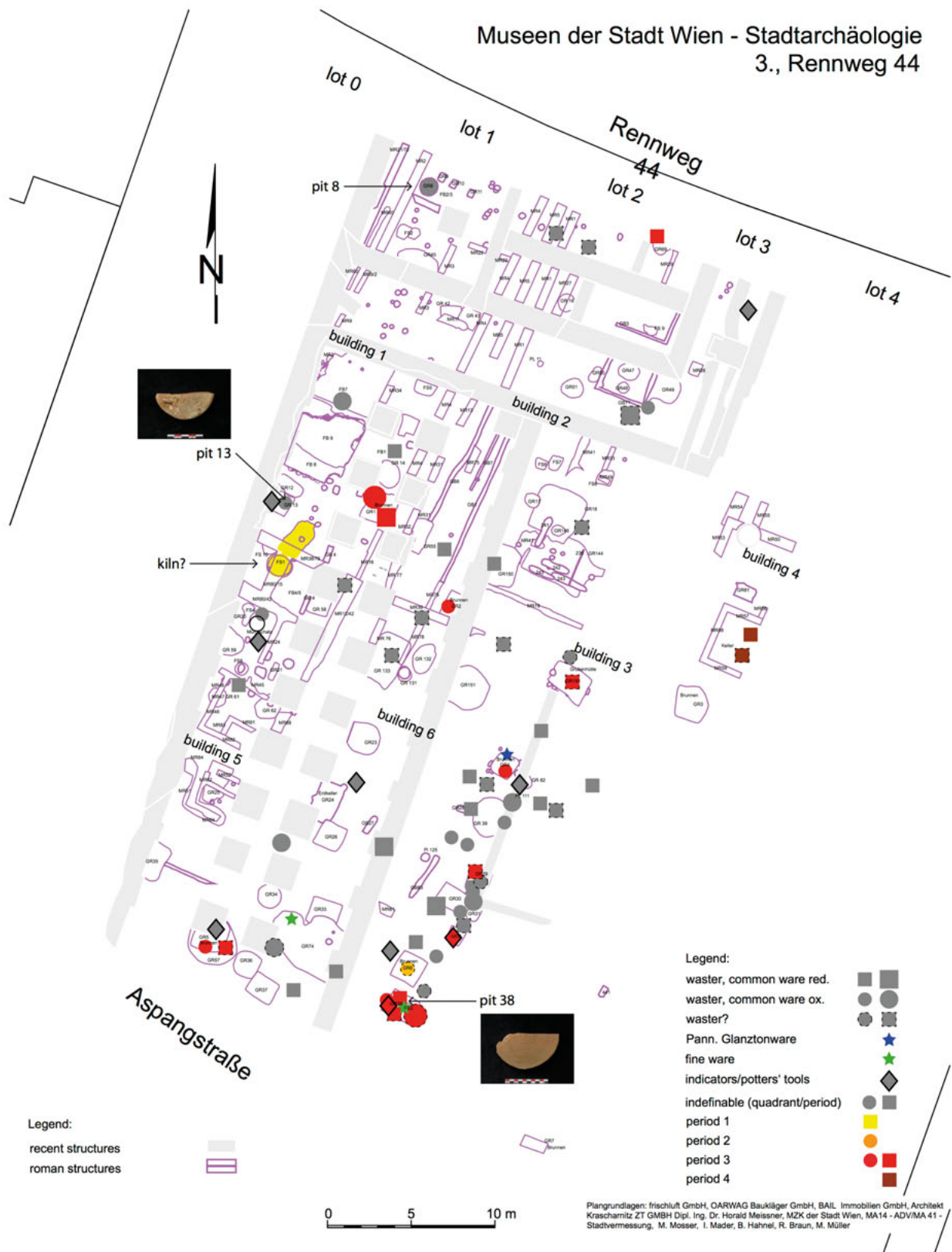
<sup>38</sup> Some imported Roman pottery from Italy recently found together with late La Tène pottery doesn't belong to this area, see K. ADLER-WÖLFEL/M. MOSSER, *Archäologie am Rochusmarkt – Die Grabungen in Wien 3, Rasumofskygasse 29–31*. Fundort Wien 18, 2015, 4; 38.

<sup>39</sup> K. ADLER-WÖLFEL, 5.1.15. Auswertung – Ein chronologischer Überblick. In: M. Mosser, *Die römischen Kasernen im Legionslager Vindobona. Die Ausgrabungen am Judenplatz in Wien in den Jahren 1995–1998*. Monogr. Stadtarch. Wien 5 (Wien 2010) 501–502.

<sup>40</sup> CHINELLI 1997; CHINELLI 1998.

<sup>41</sup> R. CHINELLI, *Eiförmige und birnenförmige Gefäße aus Wien*. In: Krinzing 2005, 143–170; R. SAUER, *II. Mineralogisch-petrographische*





**Fig. 4.** Distribution of pottery wasters and tools at Rennweg 44.



Fig. 5. Kiln wasters and misfired pottery (second rate pottery) at Rennweg 44.

single items such as a mask<sup>42</sup> and ceramic building material<sup>43</sup>. In the case of the Rennweg 44 finds, it has been financially possible to analyse all the remaining common ware forms (fig. 3), fired in oxidising atmosphere: jugs, jars/*dolia*, dishes, cups, bowls, flanged bowls, incense burners, strainers, money-boxes, lids, basins and beakers.

The aim of this archaeometric study was, first of all, to help to correlate the trace of a possible kiln on the ground<sup>44</sup> and some production indicators with activity on the site (fig. 4).

Since the settlement was located on the *limes* road (fig. 1,1), it was in a strategic position for the sale of the artefacts produced in the back yards of the *tabernae* overlooking the road.

The topographical/structural pattern in which the productive and residential complex of Rennweg 44 can be inserted is very similar to the one at Heldenbergen in der Wetterau<sup>45</sup>, where starting from the road, several structures follow on

one lot in this order: *porticus/taberna* at the ground level + living places on the first floor/well/workshop/latrine/kiln/pit for clay digging. At Rennweg 44, the sequence is not rigorously the same, because some structures are missing<sup>46</sup>.

The hypothesis of pottery production *in situ* could be suggested by its topographical position: pottery workshops have been recorded along Rennweg from the beginning of the 20<sup>th</sup> century until recently (fig. 1).

The archaeometric analyses have also helped in isolating and describing local fabrics, creating reference groups. Even though by “local” one means all the area of *Vindobona* and not just the excavation site.

Kilns wasters (e.g. fig. 5,1–3.6–8) – mostly not related to specific forms, several misfired fragments, which were perhaps usable (e.g. fig. 5,4.5.)<sup>47</sup>, some potters tools (fig. 6), and a large quantity of overfired pottery<sup>48</sup> have been identified among the Rennweg 44 pottery.

These wasters are related to common ware fired in reduced atmosphere (fragment of a bottom – fig. 5,3) and fine ware too.

Analysen von ei- und birnenförmigen Gefäßen und Vergleich mit analysierten Amphorenproben aus Vindobona. In: Krinzing 2005, 171–182

<sup>42</sup> F. BREIN/R. SAUER, Eine tönene Maske – „O Jegerl, der Mon-Mon!“ Fundort Wien 4, 2001, 4–16.

<sup>43</sup> K. ADLER-WÖFL/R. SAUER, Dachaufsatz, Lichthäuschen oder Räuchergerät? Zu einer keramischen Objektgruppe aus dem römischen Siedlungskomplex in Unterlaa. Fundort Wien 3, 2000, 158–167.

<sup>44</sup> M. MÜLLER, Wien 3, Rennweg 44. In: Krinzing 2005, 202; MÜLLER 2002, 309 Abb. 5.

<sup>45</sup> W. CZYSZ, Römische Töpferdörfer, Vici – Römische Siedlungen. Arch. Deutschland 1, 2008, 36. This pattern is also valid for settlement: JAUCH 2014, 130.

<sup>46</sup> I thank M. Müller for the discussion about the interpretation of her excavation.

<sup>47</sup> The difference between wasters and re-usable misfired pottery is not always recognizable; therefore a list with the most distinctive defected fragments was used. Such a list helps in selecting the most likely kiln wasters.

<sup>48</sup> Over-fired pottery could be significant since it is not found in every excavation on Rennweg. For example, it is totally absent at Rennweg 88–90. See, e. g. JAUCH 2014, 120 Abb. 258.

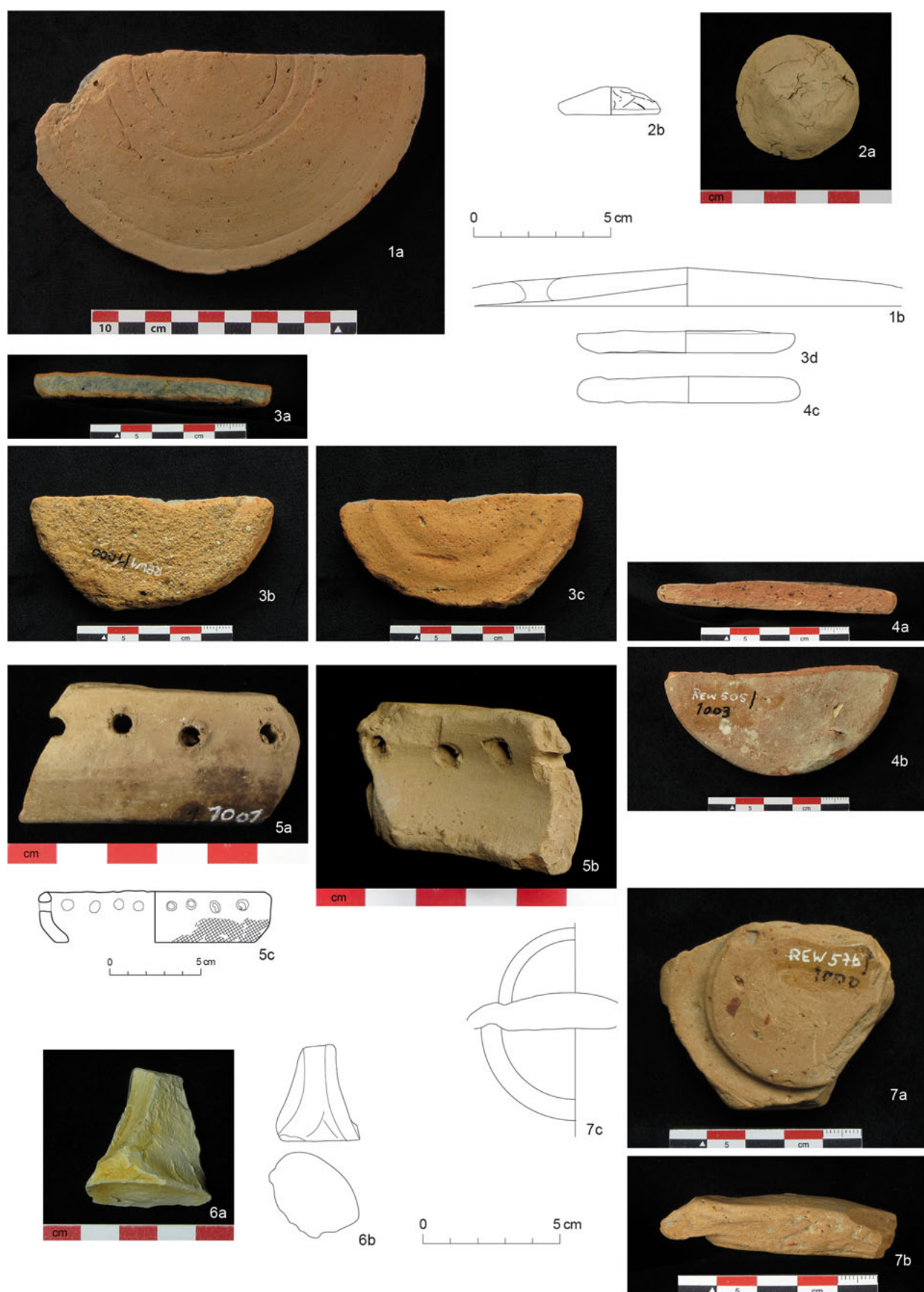


Fig. 6. Potters' tools at Rennweg 44.



## Potters' tools at Rennweg 44

A round flat disc (**fig. 6,1a–b**, Dm: 15.4 cm, thickness: 0.5 cm) has been found in a pit fill (pit 38, **fig. 4**) together with wasters and misfired pottery, which was possibly intended to be re-used (second rate pottery). The rim is only trimmed, one surface is irregular and deteriorated and the other is smooth. It has been made on the potter's wheel, as indicated by the traces left on the smooth surface. This object could be identified as a support-base to move the just rotated vessel from the potter's wheel to the work-table or to the drying area<sup>49</sup>. It could also be a base for the vessel on it, instead of placing it directly on the wheel, in order to make the detachment easy<sup>50</sup>. According to some scholars, these tools could be related to the potter's wheel construction<sup>51</sup>; according to others, they could be too light to be a potter's wheel base<sup>52</sup>. They could, however, be just one element of such a base (e.g. bat)<sup>53</sup>. In other kilns (*Patavium*, Scoppieto, Verona – working from the 1<sup>st</sup> century BC to the 3<sup>rd</sup> century AD<sup>54</sup>, *Acium*<sup>55</sup> – first half of 5<sup>th</sup> century, Alcamo<sup>56</sup>, *Alba Iulia*<sup>57</sup>, Jerusalem<sup>58</sup>...) similar objects have a diameter from 17/18 to 37 cm, and a thickness between 0.25 and 4.5 cm. As at Rennweg 44, the item from Piazza Arditì in Verona has one smooth and one coarse surface. They could also be a flat-surface support for hand-made or mould-made Pottery (e. g. figurines)<sup>59</sup>.

The interpretation is difficult because of the rarity of the finds, due both to the perishability of the tools, mostly made of wood, and their lack of standardisation, since they were made *ad hoc* by every craftsman<sup>60</sup>. Other finds, like a perforated disc (Dm: 17 cm, thickness: 1 cm, hole Dm: 3 cm), secondly worked from a dish, would have been adapted to the wheel axis insertion, but it cannot be identified with certainty, because it was found at Rennweg 88–90, out of its original context.<sup>61</sup> Three similar discs from *Patavium* and

*Acium* are too thick (3.5, 6.5 cm)<sup>62</sup>. A parallel is represented by the item extracted from a vessel bottom, found in Poland at Czerniejewo (Dm: 10 cm, thickness: 2.1 cm; hole Dm: 2 cm) with smaller dimensions, but similar proportions<sup>63</sup>: at first, it was interpreted as a spindle-whorl and later as a wheel disc.

Some little discs (**fig. 6,3a–d; 4,a–c**), have one smooth surface (**fig. 6,3c; 4b**) and the other side made coarse by sand (**fig. 6,3b**); they are comparable with other items found in kilns in Italy but also in the provinces.<sup>64</sup> They could be identified as testers to check the temperature of the kiln or as spacers among the vessels, in order to avoid them touching each other. At Rennweg 44, diverse types of spacers or firing supports have been found (**fig. 6,6a–b<sup>65</sup>.7a–c<sup>66</sup>**), some with holes made before firing (**fig. 6,5a–c**)<sup>67</sup>. They helped the heat circulation and the gas evaporation among the vessels placed to be fired on the perforated floor in the kiln chamber.<sup>68</sup>

For some objects, it is difficult to establish their use, but they have often been found in pottery workshops<sup>69</sup>.

<sup>49</sup> CUOMO DI CAPRIO 2007, 204.

<sup>50</sup> CIPRIANO/MAZZOCCHIN/ROSSIGNOLI 2006, 249; 250 Fig. 2.1.

<sup>51</sup> CAVALIERI MANASSE, MONDIN, STUANI, 2016, 64 fig. 5.

<sup>52</sup> CUOMO DI CAPRIO 2007, 189–192; D. P. S. PEACOCK, Pottery in the Roman World (New York 1982) 41–42. It can also depend on the type of wheel.

<sup>53</sup> As it has been established for the Minoic period, but in this case, they should also weigh no less than 2 kg: I. BERG, Potting Skill and Learning Networks in Bronze Age Crete. In: W. Gauß/G. Klebinder-Gauß/C. von Rüden, The Transmission of Technical Knowledge in the Production of Ancient Mediterranean Pottery. Proceedings of the International Conference at the Austrian Archaeological Institute at Athens, 23<sup>rd</sup>–25<sup>th</sup> November 2012. ÖAI Sonderschr. 54 (Wien 2015) 18 Fig. 1 Type 2.

<sup>54</sup> G. CAVALIERI MANASSE/C. MONDIN/R. STUANI, Nota preliminare sull'officina ceramica di Piazza Arditì d'Italia a Verona. Acta RCRF 44, 2016, 64. See the bibliography for other items in Italy.

<sup>55</sup> BRANCIFORTI 2006, 170 fig. d and 156 cat. 22.

<sup>56</sup> GIORGETTI/GONZALES/MURO 2011, 139; 341 Kat. 338–339; 254 Tav. LVI.

<sup>57</sup> M. CIAUŞESCU, Early pottery production in *Apulum* (Pârtoş). An overview of recent research. Acta RCRF 39, 2005, 322 Fig. 6.

<sup>58</sup> J. MAGNESS, The Roman Legionary Pottery. In: B. Arubas/H. Goldfus, Excavations on the Site of the Jerusalem International Convention Center (Binyanei Ha'uma): a Settlement of the late first to second Temple Period, the tenth Legion's Kilnworks, and a Byzantine monastic complex. Journal Roman Arch. 60, 2005, 143 Fig. 24,1–4; 98–99 Photo 27.

<sup>59</sup> CUOMO DI CAPRIO 2007, 169–170.

<sup>60</sup> A. MURPHY/J. POBLOME, Technical and Social Considerations of Tools from Roman-period Ceramic Workshop at Sagalassos (Southwest Turkey): Not Just Tools of the Trade? Journal Mediterranean Arch. 25/2, 2012, 202.

<sup>61</sup> MOSSER/CHINELLI ET AL. 2016, 133 Abb. 24.

<sup>62</sup> CIPRIANO/MAZZOCCHIN/ROSSIGNOLI 2006, 249; 250 Fig. 2,1 with a decentralized hole; BRANCIFORTI 2006, 158 fig. 28a.b.

<sup>63</sup> M. HEGEWISCH, Zur Drehscheibenkeramik im Westen der Germania Magna. Anfänge, Weiterentwicklung und Verbreitung. In: J. Bemmman et al. (ed.), Drehscheibentöpferei im Barbaricum. Bonner Beitr. Vor- u. Frühgesch. Arch. 13 (Bonn 2011) 125 Abb. 2 with bibliography. Too fragmentary: F. SEELEY/J. DRUMMOND-MURRAY, Roman Pottery Production in the Walbrook Valley. Molas Monogr. 25 (London 2005) 120 Fig. 152.

<sup>64</sup> Similar, but worked differently: M. BERGAMINI/M. GAGGIOTTI, Manufatti e strumenti funzionali alla lavorazione dell'argilla e alla cottura. In: M. Bergamini (a cura di), Scoppieto II. I materiali (Borgo San Lorenzo 2011) 355; 374 Fig. 6,2–3; C. HÖPKEN, Die römische Keramikproduktion in Köln. Kölner Forsch. 8 (Mainz 2005) 345 Taf. 85,17-010-011; B. RUDNICK, Die römischen Töpfereien von Haltern. Bodentaf. Westfalen 36 (Mainz 2001) 142 Taf. 68 Gr. 404/68/1873-1875; D. CASTELLA, Potiers et tuiliers à Aventicum: un état de la question. Bull. Assoc. Pro Aventico 37, 1995, 129 Pl. 5,85.

<sup>65</sup> Kiln-props: CHENET/GAUDRON 1955, 87 Fig. 39,c,d,h,i; B. DUFAY/Y. BARAT/S. RAUX, Fabriquer de la vaisselle à l'époque gallo-romaine. Archéologie d'un centre de production céramique en Gaule – La Boissière-École (Yvelines – France) (I<sup>er</sup> et III<sup>e</sup> siècles après J.-C.) (Versailles 1997) 96 Fig. 60,d; “colifichets”: L. PASTOR, Les ateliers de potiers de la Meuse au Rhin à La Tène Finale et durant l'époque gallo-romaine (Thèses de doctorat, Univ. Strasbourg 2010) 219–220 fig. 155.

<sup>66</sup> V. GASSNER/S. JILEK/R. SAUER, Der Töpferofen von Carnuntum, in: H. Stiglitz, Das Auxiliarkastell Carnuntum 1. Forschungen 1977-1988, Österreichisches Archäologisches Institut, Sonderschr. 29, 1997, 223 Abb. 41.44.

<sup>67</sup> D. GIORGETTI (a cura di), Le fornaci romane di Alcamo. Rassegna ricerche e scavi 2003/2005 (Roma 2006) 47 Fig. 9c; GIORGETTI/GONZALES MURO 2011, 138; 196 Kat. 333; 334; 336 Four C. CHENET/GAUDON 1955 Fig. 45,14. From the workshop: „Ruinengarten”: for glazed pottery: Z. BANKI/T. Kádas (edg.), Glasierte Keramik in Pannonien (Székesfehérvár 1992) 63 Abb. 7 Kat. 137; MAGRINI/SBARRA 2010, 75–76 Fig. 13.

<sup>68</sup> N. CUOMO DI CAPRIO, Les ateliers de potiers en Grande-Grèce: quelques aspects techniques. In: F. Blondé/J. Y. Perreault (dir.), Les ateliers de potiers dans le monde grec aux époques géométrique, archaïque et classique. Actes de la Table Ronde de l'École Française d'Athènes (2–3 oct. 1987). Bull. Corr. Hellénique Suppl. 23 (Athènes, Paris 1992) 77; CUOMO DI CAPRIO 2007, 528–529; GIORGETTI/GONZALES MURO 2011, 138–139.

<sup>69</sup> W. CZYSZ, Modelttöpfer in der römischen Ziegelei von Westheim bei Augsburg. In: J. Bellot/W. Czysz/G. Krahe (eds.), Forschungen zur provinzialrömischen Archäologie in Bayerisch-Schwaben (Augsburg 1985) 167; 173 Abb. 22,2.



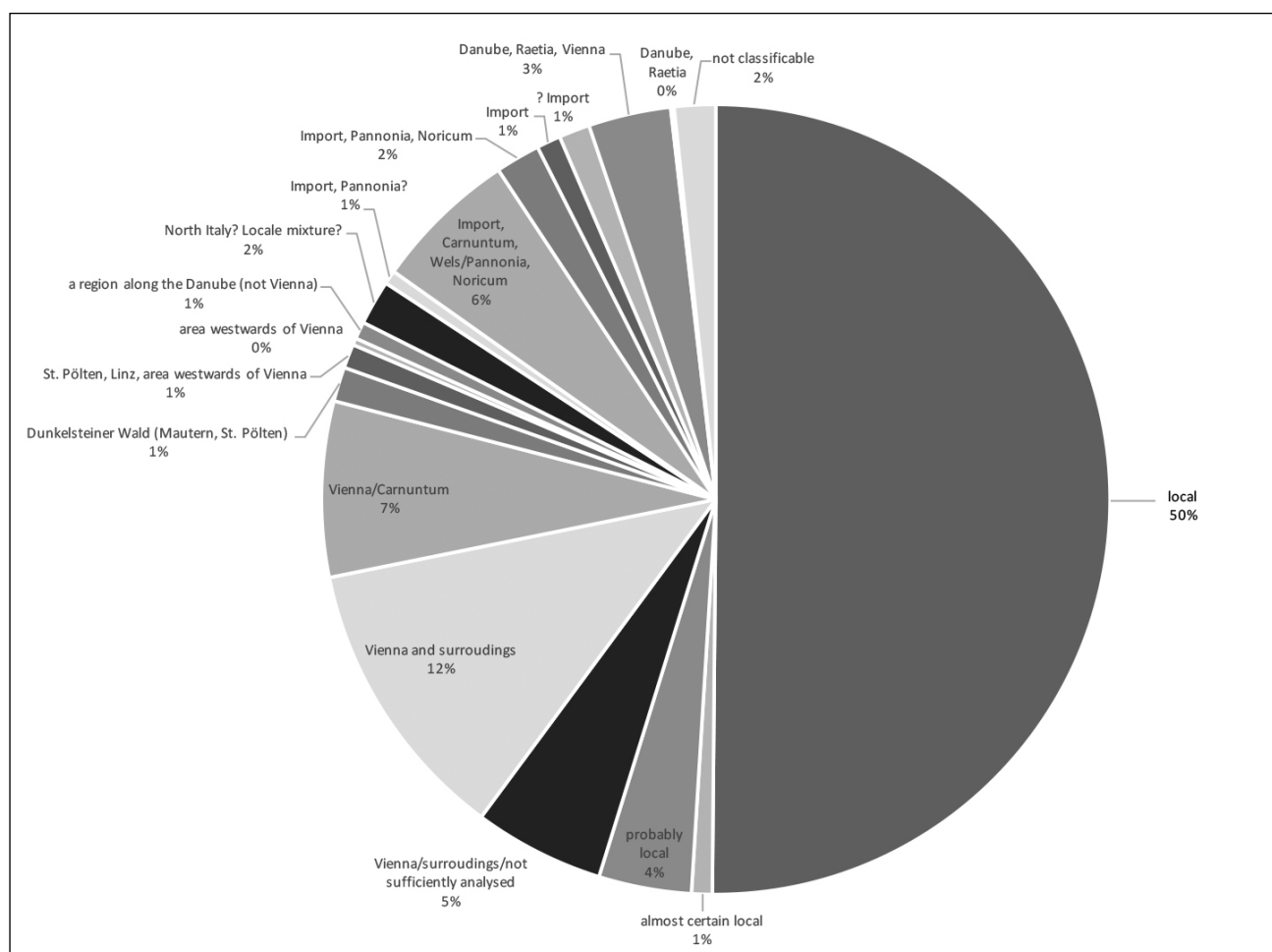


Fig. 7. Zones where raw material of Rennweg 44's common ware occurs.

#### Archaeometric analyses on Rennweg 44 – common ware (R. Sauer/R. Chinelli)

Around 830 samples of common ware (fired in oxidising atmosphere) were submitted for microscopical identification. They were taken from fragments with a recognizable form, found in interpreted layers or from finds interesting for the production. After they had been grouped into fabric types, only the still unrecognized ones were selected for archaeometric analyses, among other reasons in order to avoid excessive costs. As previously mentioned, the composition of these fabrics has been compared with raw materials from known clay deposits.

These results of the analyses (fig. 7) indicate, in summary, that, of 710 pottery items (excluding lamps<sup>70</sup> and significant pottery found in un-interpreted layers), 51 % have a local fabric, comparable to the raw material available in Vienna; 22 % of the samples are local or typical of the periphery; 7 % local or typical of *Carnuntum*; 2–4 % are typical of *Noricum*/Upper Austria-clay deposits; 8 % could be compared with clay deposits from *Noricum* or from the rest of *Pannonia*/

mostly Austria and Hungary; around 3 % of the items could be imports from Raetia among other areas, 2 % are probable imports from uncertain areas and 2 % of the fabrics cannot be fully interpreted at the moment.

The fabric analyses of the kiln wasters (not completely overfired) and of the potters' tools have shown them to be local products.

Due to the high quality of Vienna clay, raw material imports for the local production are almost unlikely<sup>71</sup>.

The main common ware production centres around *Vindobona*, well studied and published up to now, are: Mautern, *Carnuntum* and *Aelium Cetium*/St. Pölten, alongside minor centres from which there is no always verifiable evidence.<sup>72</sup> Approximately 15 % of possible imports at Rennweg 44 come from these places.

<sup>70</sup> The analysis of the lamps is treated separately by S. Sakl-Oberthaler and R. Chinelli, see MÜLLER ET AL. (forthcoming).

<sup>71</sup> CHINELLI 1997, 121.

<sup>72</sup> H. SEDLMAYER, Lokale Produktion und Alltag im römischen Niederösterreich. In: Die Römer in Niederösterreich. 24<sup>th</sup> Symposium des NÖ Instituts für Landeskunde 5.–8. Juli 2004, Tulln an der Donau. Arch. Forsch. Niederösterreich 5, 2008. 52–54 in particular see a short *excursus* in the table to update; S. ZABEHLICKY-SCHEFFENEGGER, Die Keramikfunde von Oberösterreich. In: Oberösterreich Grenzland des Römischen Reiches. Sonderausstellung des OÖ Landesmuseums im Linzer Schloss, 12. Sep. 1986 bis 11. Jan. 1987 (Linz 1986) 125–126.

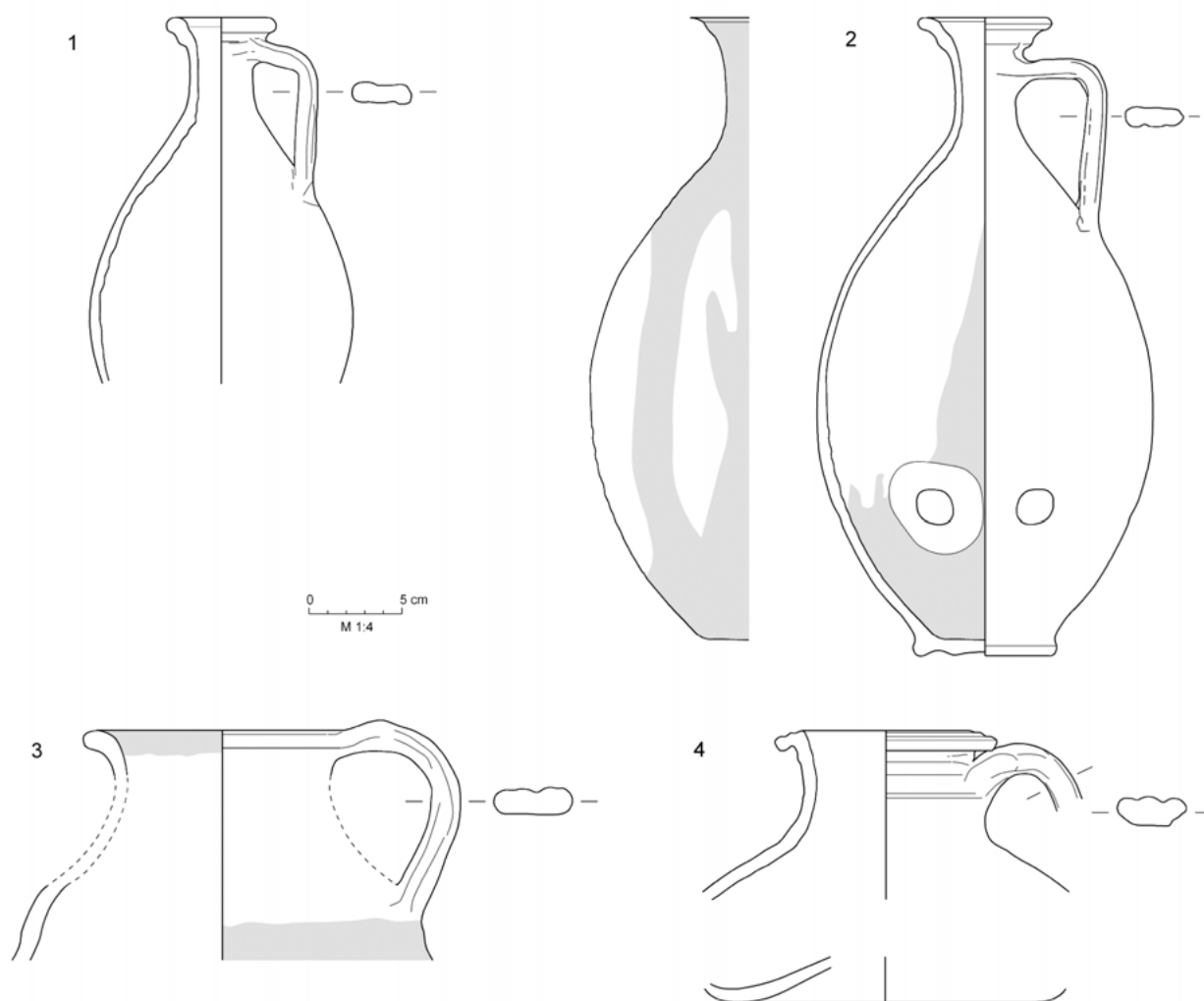


Fig. 8. The most common pottery types from Rennweg 44.

### The forms and types of local common ware production at Rennweg 44

The most frequent locally produced common ware types found at Rennweg 44 are also among the most common in *Vindobona*, and they are typical products of the 2<sup>nd</sup> century AD, listed here in sequence: the handled jug with everted rim slightly enlarged, funnel neck and oval shape (fig. 8,1); the jug with everted, flattish rim, funnel neck, here secondarily perforated, with fluid traces (fig. 8,2), which represents the type most found not only in *Vindobona* but also in *Pannonia* and in *Noricum*. Then, occurring not only in the 2<sup>nd</sup>, but also in the 3<sup>rd</sup> century: the jug with wide everted rim, red striped with a handle, usually for taking water from wells – in fact it has been found inside the excavated wells (fig. 8,3), – and the cylindrical jug, imitation of glass forms (fig. 8,4) – in my opinion a container for short distance transportation.

From a quantitative point of view: jugs, as at Rennweg 44, occur predominantly in settlements, but an unusual form, the money-box (fig. 9,7), has also been found in a considerable amount.

The following are forms, which are amongst the most significant locally-produced on site.

The flanged bowl with red slip (fig. 9,1), once considered

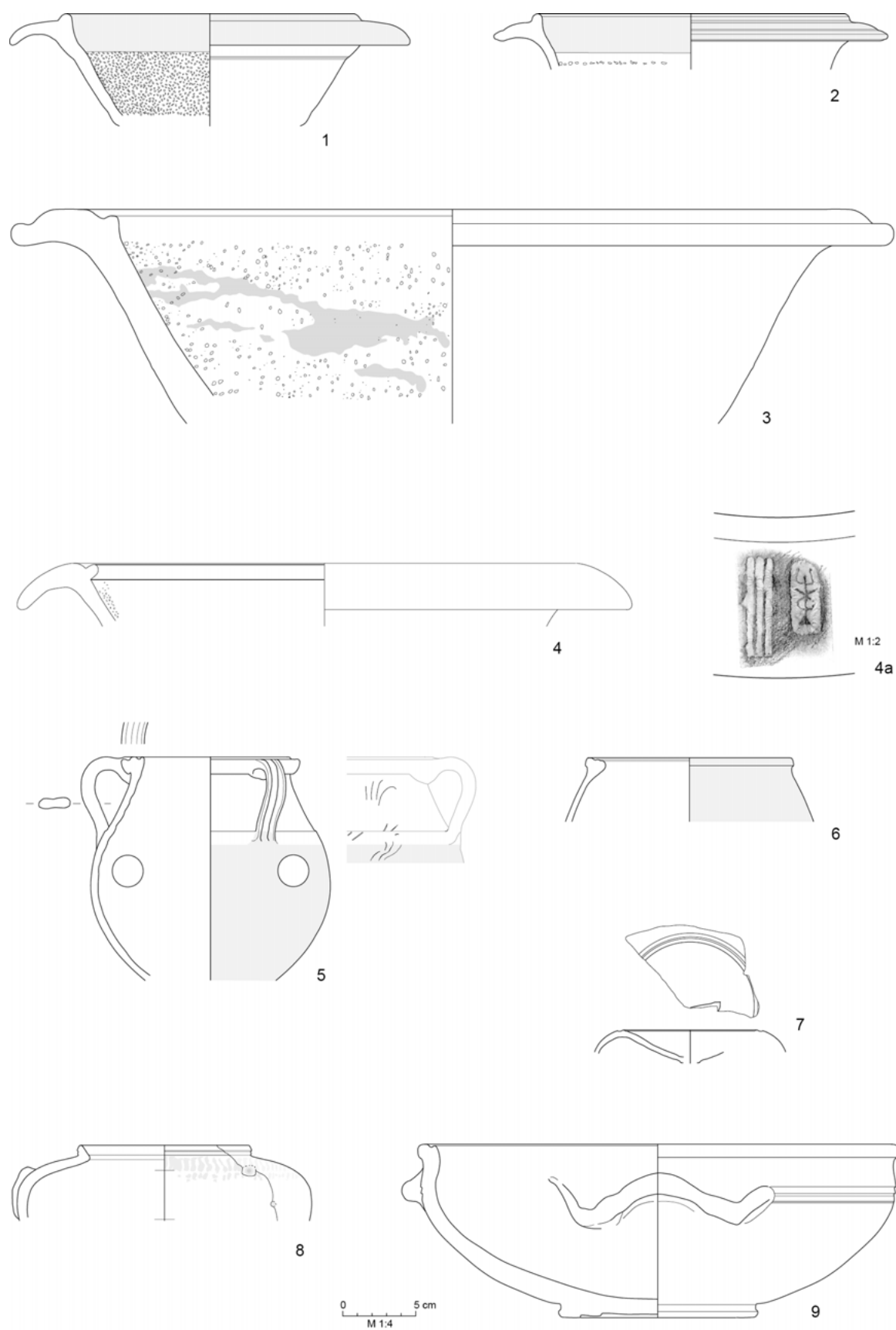
a Raetian product, remains<sup>73</sup> not proven as an import from that region, also on the basis of the new archaeometrically analysed items<sup>74</sup>. Moreover, in *Raetia* this *mortarium* has an accentuated wall-gap between the trituration grit and the slip covered area, which is usually not so marked on the items from Rennweg 44 as well as on the studied ones from *Vindobona*. A possible exception for the fabric could be an imported glazed item with noticeable dimensions, but without the wall-gap, slightly different from the morphological point of view (fig. 9,3). At Michaelerplatz (*canabae legionis*) Pannonian imitations have also been found where the slip, usually shiny and thick, is only painted by a dull water-based red colour<sup>75</sup>. At Rennweg 44 the slip of a local flanged bowl type (fig. 9,2) is orange and has the optical appearance of the Pannonische Glanztonware.

There are also *mortaria* with stamps not unlike examples from *Raetia* but the fabrics are different. The same flanged bowl type from Schwabmünchen is stamped by 17 different

<sup>73</sup> CHINELLI 1998, 155; 156 Abb. 5 WR/283/10; 157 Abb. 6 WR/283/10. Some samples were compared with Westendorf fabrics, but no similarities were found. I thank S. Radbauer for the cooperation.

<sup>74</sup> CHINELLI/SAUER in: Müller et al. (forthcoming).

<sup>75</sup> CHINELLI 1998, 155; 156 Abb. 5 WR1095/38, WR346/1; 157 Abb. 6 WR1095/38, WR346/1.



**Fig. 9.** Common ware from Rennweg 44.

names, sometimes together with figural or abstract motifs<sup>76</sup>. Two of these motifs<sup>77</sup>, though not perfectly identical, appear on another Rennweg 44 type (**fig. 9,4/4a**)<sup>78</sup>, whose fabric corresponds to the local reference groups<sup>79</sup>.

Such stamps attested in *Raetia*, in *Pannonia* demonstrate similarities but also discrepancies, so it is difficult to prove an import of “poinçons” or the presence of the same potter.

Among jars, those with a horizontal grooved rim are predominant: they are red coloured (**fig. 9,6**), decorated by (incised or painted) horizontal wavy lines or by rouletting incisions (**fig. 5,4**). These decorations also occur on local jugs. Fabrics mostly consist of calcareous clay, not suitable for use on fire – as noted by some mural paintings<sup>80</sup> – in fact, soot, fire-clouds traces are rare.

To the ritual vessels already known in *Vindobona*, the material from Rennweg 44 has probably added others, some of which are unique. Even if on these vessels freestyle decorations occur, such as plastic and incised ones (**fig. 9,5**), presumably attributable to a single potter’s inspiration, they reflect patterns especially widespread in *Pannonia* or, at least in the Danube area. Their fabrics are almost always local. Their find context allows the supposition of a ritual private use at Rennweg 44.

Although in Italy a variety of money-boxes are known, north of the Alps it is the beaker-like ones, which have been found almost exclusively. At Rennweg 44, 36 items have been recorded (**fig. 9,7**), a remarkable concentration in comparison to other zones of *Vindobona*. They are without coins inside and stratigraphically difficult to correlate with the coin deposits or with scattered coins found in the excavation, but perhaps they have to be related to local craft activities. 15 items have been subjected to sampling and the major part has a local fabric.

Not yet known in *Vindobona* and made in local fabric is a spouted strainer-bowl (**fig. 9,8**), whose use is proposed to be the mixing of wine/beer<sup>81</sup> or some medical substances. In fact, sesame<sup>82</sup> and mugwort (a medicinal plant) seeds,<sup>83</sup> have been found in metal containers of similar form. Effectively in *Vindobona* wine was imported from the Mediterranean, as attested by amphorae e.g. Dr. 2–4, Dr. 43 and from the Island Rhodes found also at Rennweg, where tools from a doctor’s practice have been found<sup>84</sup>.

Significant at Rennweg 44 is the finding of local pottery imitations of metal/glass forms, e.g., basins with omega-shaped handles (**fig. 9,9**). Such vessels could be used for food prepa-

ration or for hygienic-sanitary purposes like those with a double wall from the surgeon’s house at *Ariminum*.<sup>85</sup> Their local production expresses the wish to shape usual practices in a purely Roman style, e.g., as with the use of a metal item found at Nijmegen in a rich grave from 90 AD<sup>86</sup>. More metal vessels have been found in it, possible prototypes also for other forms found at Rennweg 44 (**fig. 10,1.6**)<sup>87</sup>. The burial belonged to a local military elite member, probably working for the *ala Batavorum*, who possibly later moved to *Vindobona* (101–114 A.D.)<sup>88</sup>.

According to some scholars, pottery imitations of other materials such as metal and glass (**fig. 8,4; 9,9; 10,1.5.6.10**) and terra sigillata (**fig. 10,7.9**), were preferred in the so-called “legionary style”<sup>89</sup>, of which at Rennweg 44 it has been also possible to distinguish some types in Fine Oxidised Ware (Holdeurn Typ 12 – **fig. 10,2**, Holdeurn Typ 20, **fig. 10,4**) and Fine Ware<sup>90</sup>. It was very common, especially in sites based on military fortresses (Nijmegen, *Aquincum*, *Carnuntum*, Jerusalem, *Vindonissa*, *Poetovio* etc.), as shown in parallels of the kind here. According to some theories, this style is derived from the movements of the legions along the *limes*. The potters, who produced pottery for the soldiers, relocated with the legions. One of these could be the above mentioned potter *Latinus*.

Some imports, such as Internal Red-Slip Cookware from the Tyrrhenian area<sup>91</sup>, or a jug, an imitation of the metal form Radnoti 77, XXXIX.2a, (Holdeurn Typ 4/Gose 237) (**fig. 10,6**) are already clearly distinguishable from the local productions macroscopically. The handles of these jugs can be decorated by an appliqué-attachment (**fig. 10,6**)<sup>92</sup>.

Thanks to the identification of local pottery, it has also been possible to isolate the imports from the neighbouring manufacturing centres, but in some cases the sediment similarities in the Vienna-*Carnuntum* basin makes their assignation difficult (**fig. 10,11**).

Some samples have also been compared to fabric types related to reference groups analysed in the past<sup>93</sup> when they were in limited quantity in the geological database. This attribution has allowed an analyses cost reduction, but, in some cases has left a certain ambiguity of interpretation, e.g., some probable cheese presses could have been produced or in the nearby *Carnuntum*, where others were found<sup>94</sup>, or in *Noricum*. In a near future it is intended to recover and update such data, in order to refine the proposed interpretations.

<sup>76</sup> SORGE 2001, 101; 104 Abb. 42.

<sup>77</sup> SORGE 2001, 88 Abb. 31.B5-B6; 87 Abb. 30.011-12. A similiar stamp to B5-6 also in: D. EBNER, Das römisches Gräberfeld Schwabmünchen. Materialh. Bayer. Urgesch. A 73 (München 1997) 51 Abb. 6.4.

<sup>78</sup> Inv. Nr. 199/1000.

<sup>79</sup> CHINELLI 1998, 156 Abb. 5, Sch 1Rei: from WR160/1 to WR1068/41.

<sup>80</sup> Pompei, villa of Giulia Felice: C. PARISI PRESCICCE/O. ROSSINI, Nutrire l'impero. Storie di alimentazione da Roma a Pompei (Roma 2015) 87 fig. 5.

<sup>81</sup> P. R. SEALEY, VI. Finds from the Cauldron Pit. In: N. R. Brown, The archaeology of Ardleigh, Essex. Excavations 1955–1980 (Chelmsford 1999) 121.

<sup>82</sup> E. SAUER, Wendlebury (Alchester Fortress): Headquarters, Granary and Timber Bridge. South Midlands Arch. 33, 2003, 98; H. D. KENNETT, The Felmersham [Bedfordshire] Fish-head spout: a suggested reconstruction. Ant. Journal 50, 1970, 87 Fig. 1; 88.

<sup>83</sup> PH. CRUMMY ET AL. 2007, Stanway: an élite burial site at Camulodunum. Britannia Monogr. 24 (London 2007) 203 Fig. 98, CF47.22; 398.

<sup>84</sup> T. BEZECZKY, Roman Amphorae from Vindobona. In: Krinzinger 2005, 69.

<sup>85</sup> S. DE CAROLIS (a cura di), Ars Medica. I ferri del mestiere (Rimini 2009) 33; 31 Fig. 19.

<sup>86</sup> KOSTER 2013, 409 Pl. 29,39; for other indications 139–140 (burial 8).

<sup>87</sup> KOSTER 2013, 408 Pl. 28,33–34 (burial 8).

<sup>88</sup> M. MOSSER, Die römischen Truppen in Vindobona. Fundort Wien 8, 2005, 149.

<sup>89</sup> MEYER FREULER in: J. Trumm/M. Flück, Am Südtor von Vindonissa, 22. Veröff. Ges. Pro Vindonissa (Zürich 2013) 367.

<sup>90</sup> Not all local. I thank E. Eleftheriadou for the information.

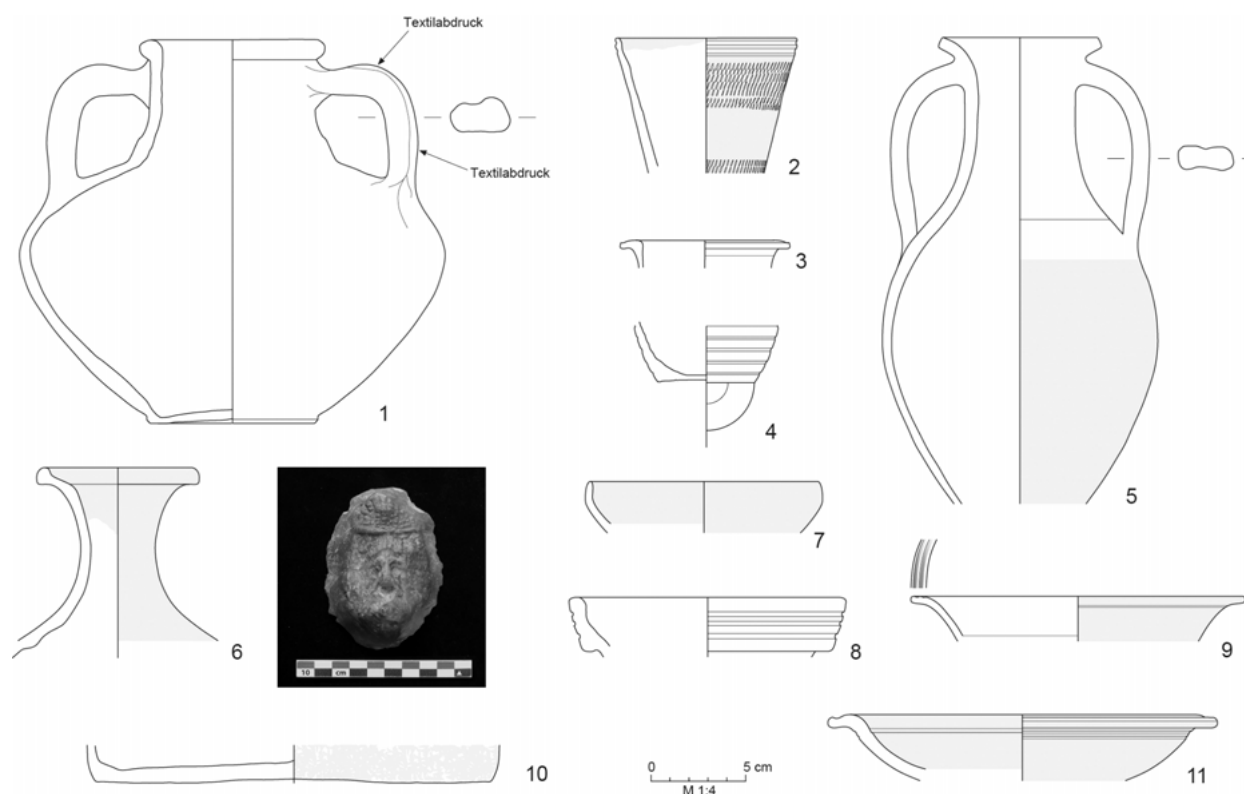
<sup>91</sup> R. CHINELLI/M. MOSSER/H. SEDLMAYER, Prodotti italici tra la zona padano-adriatica e il Danubio. La testimonianza di alcuni classi materiali. Ant. Alto Adriatiche 65, 2007, 837 fig. 3,6.

<sup>92</sup> KOSTER 2013 408 Pl. 28,33; G. FÉNYES, Untersuchungen zur Keramikproduktion von Brigetio. Acta Arch. Acad. Scien. Hungaricae 65 2003, 109–110; 107 Abb. 4.1.

<sup>93</sup> C. ORTON/M. HUGHES, Pottery in Archaeology (Cambridge 1993/2003<sup>2</sup>) 77.

<sup>94</sup> W. JOBST (Hrsg.), Carnuntum. Das Erbe Roms an der Donau (Wien 1992) 480 Kat. 308 Inv. Nr. 3137; <https://www.carnuntum-db.at/objektdetail.aspx?obj=10997>.





**Fig 10.** Some of the possible “legionary pottery” at Rennweg 44.

From the comparative analysis of the pottery, also carried out by microscope in collaboration with I. Pavić-Berger, an occasional fabric similarity among common ware and Pannonische Glanztonware of local provenance has been noticed. A lot of forms are also the same.

#### Distribution of pottery wasters and tools at Rennweg 44

As we can see in the distribution map of the kiln wasters (**fig. 4**), here identified by round, square and star-shaped symbols, they are concentrated on the south side of the excavation. Among the colours attributed to a precise chronological phase, the colour red predominates, corresponding to the period between 180 and 270 AD. The rhomboid symbols correspond, instead, to potter’s tools, and two of them are also referable to this phase. To the north, **pit 8** is shown, in which, according to the interpretation of M. Müller, a potter’s wheel could have been placed.<sup>95</sup>

However, neither the major part of the kiln wasters nor such the pit belong stratigraphically to the first chronological period (80–140 AD) to which this presumed kiln is dated.

Some tools and wasters – in this map marked in gray, since not fully supported by the stratigraphic documentation – probably come from **pit 13**, dated to the same period as the kiln close to it.

The wall fragment of a jug from this pit reveals shiny black traces.

Similar traces have been analysed by Eugen Libowitzky and Hen van Keulen, with three different methodologies (gas chromatography, infrared spectroscopy, chromatography analysis) and they have been identified as birch tar and pine resin<sup>96</sup>. The wide range of applications of these substances in antiquity, especially as adhesive and waterproofing agents<sup>97</sup>, doesn’t allow the recognition of their precise use in the site. In kilns they were also used for the fire chamber temperature regulation, in which surroundings they were usually produced<sup>98</sup>. This could also be the case at Rennweg 44, given the find of a vessel pitched on the walls, but not on the bottom (*destillatio per descensum*)<sup>99</sup>.

Among the diverse observed traces it has also been possible to identify some regarding the manufacturing process when the vessels were still at the hard leather state, such as those left by a rag during the making of a probably local double-handle jug (**fig. 10,1**)<sup>100</sup> or by the potter’s fingerprints on a jug’s internal bottom (**fig. 5,5**).

<sup>95</sup> I thank the colleagues: the complete analyses will be published in MÜLLER ET AL. (forthcoming).

<sup>97</sup> JAUCH 1994, 116.

<sup>98</sup> A. VERNHET, Un four de La Graufesenque (Aveyron): la cuisson des vases sigillés. Gallia 39, 1981, 2 ; 42.

<sup>99</sup> JAUCH 1994, 117.

<sup>100</sup> They have revealed rare information about Roman textiles. K. GRÖMER, Römische Textilien in Noricum und Westpannonien im Kontext der archäologischen Gewebefunde 2000 v. Chr. –500 n. Chr. in Österreich. Austria Antiqua 5 (Graz 2014) 167; 280 Taf. 45, Rö-184.

<sup>95</sup> I thank M. Müller for the information. A. DESBAT, Le tour de potier romain, *rota figularis*, questions techniques. SFECAG Actes Congrès Charges 2014 (Marseille 2014) 540 Fig. 9.

## Conclusions

Referring back to the pottery production, an *in situ* or nearby production is possible, even if not demonstrable.

The study of the Rennweg 44 material allows, then: 1) the identification and characterisation of new local fabrics, 2) the identification of potters' tools, until now unknown in *Vindobona*, 3) an enlargement of the typology, 4) an additional attestation of pottery manufacture along the limes road. This road was not only the main commercial connection artery, but also the vector that united (even if indirectly) the important clay deposits in Hernals and the forest zone westwards of the legionary fortress to the civilian settlement and perhaps to further deposits in the east of *Vindobona*.<sup>101</sup>

This production pattern of common ware of *Vindobona* needs additional studies, for example for a deeper understanding of the correlations mostly with the other pottery classes produced locally as well as with the bricks, for studying the mechanisms of their organisation and those of commercial diffusion.

It is, however, a regional model, as is typical for common ware, but certainly not devoid – as seen – of widespread influences from the whole empire: on one hand, it reflects the formal *spectrum* present mainly in the northern provinces e.g. in the repetition of certain forms: beaker-like money-boxes, cheese-presses, vessels with applied snakes (*crustula*-moulds, Rennweg 64); on the other hand it impregnates them with a local character, assuming singular connotations (probably the result of pre-existent population's preferences) in a common framework (see e.g. the imitations of metal prototypes, and terra sigillata originally present in Italy).

## New research perspectives

The results now exposed suggest new research perspectives for common ware production in *Vindobona*. First of all, they can be correlated with some recent discoveries along the Rennweg:

- a) the finding of money-boxes in the most recent excavations at Rennweg 52<sup>102</sup>, 73<sup>103</sup>, 88/90<sup>104</sup>, by M. Mosser and K. Adler-Wölfl, could perhaps clarify if their concentration in Rennweg 44 and in the old excavations of Rennweg 14<sup>105</sup> and Obere Bahngasse 4–8<sup>106</sup>, all on the limes road,

was due to production, trade or to both activities. They were probably also produced in a kiln at Rennweg 64 (**fig. 1,2**), in whose service pit they were found<sup>107</sup>.

- b) The probable production of common ware and Pannonische Glanztonware, e.g., in the Boerhaavgasse kiln (**fig. 1,4**), supported by the similarity of the fabrics here observed, could be ascertained in a possible future study of the Rennweg 64 (**fig. 1,2**) excavation<sup>108</sup>. In this recent excavation, around 80 % of the material was Pannonische Glanztonware and some kiln wasters also referred to the common ware. "Poinçons" for the vegetal decoration, typical of this pottery,<sup>109</sup> have been found between Rennweg 92 and 102 (close to **fig. 1,3**). Generally this class is present in *Vindobona* with a noticeable variety of forms and decorations, in addition to a remarkable abundance of material<sup>110</sup>.
- c) The tools for the pottery production found at Rennweg 44 reappear, though in slightly different forms, in this same street at the numbers 64 (**fig. 1,2**), 73 and 88–90. The comparison could make more accurate the interpretation of such uncommon finds often found out of context.
- d) The typology and the fabric types of the pottery studied at Rennweg 44 have already been used to study the pottery from recent excavations.<sup>111</sup>

This picture could be greatly extended by the study of Rennweg 64 kilns (**fig. 1,2**), where a lot of kiln-wasters (*crustula*-moulds, jugs, bowl), potters' tools (moulds, spacers, stone-pebble polishers) and interesting new aspects have been found recently<sup>112</sup>.

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<sup>101</sup> In the 18<sup>th</sup> century AD, clay deposits from this zone were used to produce bricks, I thank M. Mosser for this information.

<sup>102</sup> Inv. Nr. 108352.

<sup>103</sup> See the excavation: K. ADLER WÖFL, Wien 3, Rennweg 73. Fundort Wien 19, 2016, 167–175.

<sup>104</sup> MOSSE, CHINELLI ET AL. 2016, 132 Abb. 22.

<sup>105</sup> Inv. Nr. 828 = 579. A. SCHÖRGENDORFER, Die römische Keramik der Ostalpenländer. ÖAI, Sonderschr. 13 (Brünn, München, Wien 1942) Taf. 47 Fig. 579.

<sup>106</sup> Inv. Nr. 34203.

<sup>107</sup> R. IGL, KG Landstraße, 3. Bezirk. Fundber. Österreich 50, 2011, 456; MOSSE/CHINELLI ET AL. 2016, 131 footnote 93. For informations I thank R. Igl.

<sup>108</sup> The ascertained similarity between the common ware fabric and Pannonische Glanztonware per se could only be due to the utilisation of clay that didn't need the addition of temper and therefore they were used, albeit in different ways, in the production of various materials. Also in the Steingasse brick kiln (**fig. 1,8**), brick wasters have been found, whose fabric presents a great archaeometric resemblance with the Boerhaavgasse 29 kiln wasters fabric and with the *mortaria* at Michaelerplatz. CHINELLI 1998, 156; CHINELLI 1997, 121; R. SAUER, manuscript in the archives of Stadtarchäologie Wien.

<sup>109</sup> F. V. KENNER, Römische Funde in Wien 1908–1910. Jahrb. Altkde. 5, 1911, 144b Fig. 39; KRONBERGER 2004, 101 Abb. 14.

<sup>110</sup> I. PAVIĆ, Zum Formenspektrum der pannonischen Glanztonkeramik vom Wien 1, Michaelerplatz. Fundort Wien 2004, 118–166.

<sup>111</sup> MOSSE/CHINELLI ET AL. 2016.

<sup>112</sup> I thank R. Igl and the private company Soulier.

## Bibliography

- BRANCIFORTI 2006 M. G. BRANCIFORTI (ed.), *L'area archeologica di Santa Venera al Pozzo – Acium, Antiquarium*, (Palermo 2006).
- CAVALIERI MANASSE/  
MONDIN/STUANI 2016 G. CAVALIERI MANASSE/C. MONDIN/R. STUANI, Nota preliminare sull'officina ceramica di Piazza Arditì d'Italia a Verona. *Acta RCRF* 44, 2016, 53–71.
- CHENET/GAUDRON 1955 G. CHENET/G. GAUDRON, *La céramique sigillée d'Argonne des II<sup>e</sup> et III<sup>e</sup> siècles*. Gallia Suppl. 6 (Paris 1955).
- CHINELLI 1997 R. CHINELLI, Analisi archeometriche sui mortai di Michaelerplatz. A proposito di alcuni mortai di probabile provenienza africana. In: S. Santoro/B. Fabbri (eds.), *Il contributo delle analisi archeometriche allo studio delle ceramiche grezze e comuni: il rapporto forma/funzione/impasto*. Atti della 1<sup>a</sup> Giornata di archeometria della ceramica, Bologna (Bologna 1997) 121–127.
- CHINELLI 1998 R. CHINELLI, Die Reibschalen der Grabung Michaelerplatz 1990–91: Archäometrische Analysen. *Fundort Wien* 1, 1998, 153–159.
- CHINELLI 2010 R. CHINELLI, Some Notes about the Production of Late Roman Glazed Pottery in Vindobona (R. Sauer, Appendix. Thin section analyses of selected samples). In: MAGRINI SBARRA 2010, 43–70.
- CHMELAR/MOSSER/  
JÄGER-WERSONIG 2011 W. CHMELAR/M. MOSSER/S. JÄGER-WERSONIG, KG Landstraße, 3. Bezirk Fundber. Österreich 50, 2011, 453–456.
- CIPRIANO/MAZZOCCHIN/  
ROSSIGNOLI 2006 S. CIPRIANO/S. MAZZOCCHIN/C. ROSSIGNOLI, Un nuovo centro di produzione ceramica a Patavium. In: S. Menchelli/M. Pasquinucci, *Territorio e produzioni ceramiche. Paesaggi, economia e società in età romana*. Instrumenta 2, (Pisa 2006) 245–255.
- CUOMO DI CAPRIO 2007 N. CUOMO DI CAPRIO, *Ceramica in archeologia 2. Antiche tecniche di lavorazione e moderni metodi d'indagine* (Roma 2007).
- DONAT 2003 P. DONAT, Von einem biedermeierzeitlichen Malerwerkplatz zu den möglichen Hinterlassenschaften einer römischen Keramikwerkstatt am Wiener Michaelerplatz. *Fundort Wien* 6, 2003, 68–94.
- GIORGETTI/GONZALES MURO 2011 D. GIORGETTI/X. GONZALES MURO, *Le fornaci romane di Alcamo. Rassegna di studi e ricerche 2006–2008*. Catalogo dei materiali (Imola 2011).
- JAUCH 1994 V. JAUCH, Eine römische Teersiederei im antiken Tasgetium-Eschenz. *Arch. Schweiz* 1994, 111–119.
- JAUCH 2014 V. JAUCH, *Vitodurum 10. Monogr. Kantonarch. Zürich* 45 (Zürich, Egg 2014).
- KOSTER 2013 A. KOSTER, *The Cemetery of Noviomagus and the Wealthy Burials of the Municipal Elite* (Nijmegen 2013).
- KRINZINGER 2005 F. KRINZINGER (Hrsg.), *Vindobona. Beiträge zu ausgewählten Keramikgattungen in ihrem topographischen Kontext*. *Arch. Forsch.* 12 (Wien 2005).
- KRONBERGER 2004 M. KRONBERGER, Zu römischen Töpferöfen in den südlichen canabae legionis. *Fundort Wien* 7, 2004, 82–111.
- MAGRINI/SBARRA 2010 CH. MAGRINI/F. SBARRA (eds.), *Late Roman Glazed Pottery in Carlino and in Central-East Europe. Production, Function and Distribution. Proceedings of the Second International Meeting of Archaeology in Carlino* (March 2009). BAR Internat. Ser. 2068 (Oxford 2010).
- MOSSER 2015 M. MOSSER (with K. Adler-Wölfl), *Die Legionsziegelei von Vindobona im 17. Wiener Gemeindebezirk*. *Fundort Wien* 18, 2015, 50–93.
- MOSSER, CHINELLI ET AL. 2016 M. MOSSER/R. CHINELLI ET AL., *Vorbericht zur Grabung Wien 3, Rennweg 88-90*. *Fundort Wien* 19, 2016, 110–142.
- MÜLLER 2002 M. MÜLLER, *Die Auswertung der Grabungen Rennweg 44, (1989/90) im Bereich der römischen Zivilsiedlung von Vindobona*. *Fundort Wien* 5, 2002, 302–312.
- MÜLLER ET AL. 2018 M. MÜLLER ET AL., *Ein Wohn-, Handwerks- und Einkaufsbereich in der römischen Zivilsiedlung von Vindobona. Die Ausgrabungen in Wien 3, Rennweg 44*. Monogr. Stadtarch. Wien 11 (Wien 2018).
- MÜLLER ET AL. (forthcoming) M. MÜLLER ET AL., *Die Keramikfunde. Die Ausgrabungen in Wien 3, Rennweg 44*. Monogr. Stadtarch. Wien (forthcoming).
- SORGE 2001 G. SORGE, *Die Keramik der römischen Töpfersiedlung Schwabmünchen, Landkreis Augsburg*. Materialh. Bayer. Vorgesch. 83 (Kallmünz 2001).

